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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

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STRUCTURAL ANALYSIS SUBCOMMITTEE

+ + + + +

WEDNESDAY

APRIL 8, 2015

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ROCKVILLE, MARYLAND

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The Subcommittee met at the Nuclear Regulatory Commission, Two White Flint North, Room T2B1, 11545 Rockville Pike, at 1:30 p.m., Peter C. Riccardella, Chairman, presiding.

COMMITTEE MEMBERS:

- PETER C. RICCARDELLA, Chairman
- RONALD G. BALLINGER, Member
- DENNIS C. BLEY, Member
- MICHAEL L. CORRADINI, Member
- DANA A. POWERS, Member
- JOY REMPE, Member
- MICHAEL T. RYAN, Member

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STEPHEN P. SCHULTZ, Member

GORDON R. SKILLMAN, Member

JOHN W. STETKAR, Member

DESIGNATED FEDERAL OFFICIAL:

KENT L. HOWARD, SR.

ALSO PRESENT:

EDWIN M. HACKETT, Executive Director, ACRS

JUNE CAI, OEDO

YAMIR DIAZ-CASTILLO, NRO/DCIP

ACE HOFFMAN*

BRIAN HARRIS, NRR/DPR

GREG KAMMERDEINER, First Energy

GLORIA KULESA, NRR/DE

JOHN W. LUBINSKI, NRR/DE

RICHARD P. MCINTYRE, NRO/DCIP/MVIB

ABY MOHSENI, NRR/DPR

EMMETT MURPHY, NRR/DE

EDWARD H. ROACH, NRO/DCIP/MVIB

REBECCA SIGMON, NRR/DIRS

*Present via telephone

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P-R-O-C-E-E-D-I-N-G-S

(1:30 p.m.)

CHAIRMAN RICCARDELLA: Welcome, all.

The meeting will now come to order. I'm Pete Riccardella, Chairman of the Structural Analysis Subcommittee. The Subcommittee will review and discuss the lessons learned from the San Onofre Nuclear Generating Station, steam generator tube degradation event.

ACRS Members in attendance include, Joy Rempe, Ron Ballinger, Mike Ryan, Dana Powers, Dick Skillman, and myself. Kent Howard of the ACRS staff is designated as the federal official for this meeting.

This afternoon we'll hear from the Office of Nuclear Reactor Regulation, Office of New Reactors, and the Executive Director for Operations regarding this matter.

This Subcommittee will gather information, analyze relevant issues and facts, and formulate proposed positions and actions, as appropriate for deliberation by the full Committee.

The rules for participation in today's meeting have been announced as part of the notice of this meeting in the Federal Register.

We've not received written comments or

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1 requests for time to make oral statements from members
2 of the public regarding today's meeting. The entire
3 meeting will be open to public attendance.

4 There will be a phone bridge line, but to
5 preclude interruption of the meeting, the phone will
6 be placed in the listening mode during presentations
7 and Committee discussion. We will open the line for
8 comments afterwards.

9 A transcript of this meeting is being kept
10 and will be made available as stated in the Federal
11 Register notice. Therefore I request that
12 participants of the meeting use the microphones located
13 throughout the meeting room when addressing the
14 Subcommittee.

15 Participants are requested to please
16 identify themselves, and speak with sufficient clarity
17 and volume so that all may be readily heard. I also
18 request that people mute any beepers, or cell phones
19 that they have.

20 And Steve Schultz has just joined us,
21 another Subcommittee Member.

22 We're now proceeding with the meeting and
23 I call upon Aby Mohseni to begin the presentation.

24 MR. MOHSENI: Thank you very much, Mr.
25 Chairman. Thank you for the opportunity to discuss the

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1 staff's findings. We will be briefing you on the
2 staff's review of lessons learned from the SONGS tube
3 degradation event.

4 Today with me are the following
5 individuals, from NRR, Rebecca Sigmon from the Division
6 of Inspections and Regional Support, Operating
7 Experience Branch. Gloria Kulesa and Emmett Murphy,
8 both from the Division of Engineering. June Cai, from
9 Office of DEDO, and from NRO, Yamir Diaz-Castillo from
10 the Division of Construction Inspection and
11 Operational Programs.

12 And there are also members in the audience
13 that have supported this review and will continue their
14 support going forward.

15 On March 6th, 2015 the NRC staff issued a
16 review of lessons learned from San Onofre steam
17 generated steam tube degradation event. In response
18 to the EDO's tasking memo dated March 20th, 2014. This
19 report evaluated the NRC's response to the event, and
20 identified possible improvements to NRC's processes
21 and programs.

22 This review looked at how NRC programs and
23 processes responded to the event as it unfolded, and
24 whether or not changes to those processes could provide
25 a more effective response in the future.

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1 As a result of this comprehensive review,
2 the NRC staff identified 17 actions across eight
3 topics. Those eight topics include, 10 CFR 50.59
4 Process, Confirmatory Action Letter as a Regulatory
5 Tool, Steam Generator Technical Review, Organization
6 Rules and Responsibilities, Communication and External
7 Interactions, Commission Separation of Function-
8 Communication Challenges, Implementation of the
9 Inspection Manual Chapter 351, and Vendor Oversight.

10 The actions range in scope from minor
11 procedural changes, to broad evaluations of the
12 inspection process. And many of them are already
13 underway.

14 However, for the purposes of this briefing
15 today, we are focusing on the following three topics,
16 Steam Generator Technical Review, Communication and
17 External Interactions, and Vendor Oversight.

18 (Off the record comment)

19 MR. MOHSENI: These topics are key
20 elements in the review and we wanted to discuss early
21 in the process. The overall conclusion in each of the
22 topic areas was that NRC processes were sound. They
23 were implemented as intended. And worked effectively
24 to ensure health and safety.

25 The actions that were identified are

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1 enhancements that we hope can improve the efficiency
2 and effectiveness of these processes, building on what
3 we learned from this technically complex and highly
4 visible event.

5 Now we'll turn it to Rebecca.

6 MS. SIGMON: Good afternoon. So to build
7 on what Aby was saying, on March 6th, 2015, the NRC staff
8 issued the review of lessons learned from the San Onofre
9 steam generator tube degradation event. This was in
10 response to the EDO's tasking memorandum from March
11 20th of last year.

12 The report was made public on March 16th,
13 and evaluated the NRC's response to the event and
14 identified possible improvements to NRC processes and
15 programs.

16 Note that this review is not looking at the
17 actions of the licensee, Southern California Edison,
18 or the steam generator vendor, Mitsubishi Heavy
19 Industries. This review looked at how the NRC programs
20 and processes responded to the event as it unfolded.

21 And whether changes to those processes
22 could have prevented the event from occurring? Or
23 whether improvements could be made to provide a more
24 effective response in the future in any of the areas
25 that were touched on in this review?

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1 To compile the report, eight topically,
2 it's in four offices, NRR, NRO, Office of the General
3 Counsel, and OEDO, worked to get directly with Working
4 Group Members from several different offices. And
5 gathered input from numerous staff across the agency.

6 The report touched on all aspects of the
7 NRC's response to the SONGS event and the technical
8 evaluation of the root cause of the steam generator tube
9 degradation, to the public website updates, and the
10 effectiveness of the oversight process, to the legal
11 challenges that emerged.

12 As a result of this comprehensive review,
13 the NRC staff identified 17 actions across the eight
14 topics. This is a deliberate distinction that we're
15 making here. These are not recommendations. They are
16 actions, ranging in scope from minor procedural changes
17 to broader evaluations of the inspection process. And
18 many of these actions are already underway.

19 The overall conclusion in each of the topic
20 areas, was that NRC processes were sound. They were
21 implemented as intended, and worked effectively to
22 ensure health and safety.

23 The actions that were identified are
24 enhancements that we hope can improve the efficiency
25 and effectiveness of these processes, building on what

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1 we learned from this technically complex and highly
2 visible event.

3 Just to provide the basic background. On
4 January 31st, 2012, operators at San Onofre Unit 3,
5 noted indications of primary-to-secondary leakage.
6 Following plant procedures, they trended the leak rate,
7 and initiated a rapid shutdown when the leak rate
8 reached 75 gallons per minute, with a technical
9 specification when it was 150 gallons per minute, and
10 isolated the affected steam generator.

11 Total radiation released to the
12 environment was about .00005 millirem, a tiny fraction
13 of the allowed regulatory dose to members of the public.

14 Once the plant reached cold shutdown on
15 February 2nd, the licensee performed eddy current
16 testing, and verified a leak in one tube of the affected
17 steam generator.

18 Testing also found unexpected wear and
19 degradation of multiple tubes in both steam generators
20 for Unit 3. And similar degradation was found during
21 similar testing on the Unit 2 steam generators that had
22 been conducted a few weeks earlier.

23 At the time of the Unit 3 shutdown, Unit
24 2 was already shutdown for a scheduled refueling outage
25 and steam generator inspection. Based on these

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1 results, the licensee initiated in situ pressure
2 testing with selected tubes in Unit 3 steam generators,
3 to verify their integrity.

4 During these tests, the tubes were
5 pressurized at successively higher pressures, up to
6 three times normal operating pressure, to verify
7 technical specification requirements from it.

8 Eight tubes in the affected steam
9 generator failed the in situ pressure testing, with
10 three of the tubes failing below the pressure expected
11 during a main steam line rupture.

12 All tubes tested in the opposite steam
13 generator, and in the Unit 2 steam generators, passed
14 the in situ pressure testing. Following the results
15 of this testing, the NRC charted an augmented
16 inspection team to review the event, the licensee's
17 response, and the root cause evaluation.

18 The NRC Vendor Inspection Program also
19 performed an inspection of the Corrective Action and
20 Quality Assurance Programs at Mitsubishi Heavy
21 Industry, to verify that sufficient actions had been
22 taken to preclude design interface control issues that
23 had contributed to the San Onofre event.

24 Results of the augmented inspection team
25 and follow-up inspection concluded, one design control

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1 violation, a 10 CFR 50, Appendix B, Criterion III, which
2 was white for Unit 3, and green for Unit 2, for the
3 failure to verify the adequacy of the thermal-hydraulic
4 and flow induced vibration design of the replacement
5 steam generators.

6 Two additional --

7 MEMBER SKILLMAN: Rebecca, if I could ask,
8 why is the significance different between the two
9 units, please?

10 MS. SIGMON: Basically it comes down to,
11 the Unit 3 actually had, it had more severe degradation
12 at Unit 3. And they also had the actual tube leak.

13 MEMBER SKILLMAN: Thank you.

14 MS. SIGMON: Two additional green,
15 non-cited violations for deficiencies. One related to
16 shipping and transport of the steam generators. And
17 one related to post-scrum response actions. And one
18 licensee identified violation related --

19 (Off the record comments)

20 MS. SIGMON: -- to retainer bar design.
21 The vendor inspection also resulted in one notice of
22 non-conformance, related to inadequate design
23 interface control between the different design
24 sections in Mitsubishi Heavy Industry.

25 The technical complexity of the event

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1 combined with the protracted nature of the shutdown,
2 and the high visibility nature of events at San Onofre
3 in general, led to significant public outreach efforts.

4 These required coordination among
5 technical reviewers, and project management staff in
6 NRR, inspectors in the Region IV office, and at the
7 site, and Public Affairs staff and OPA.

8 The unique aspects of this event provided
9 an opportunity for this lessons learned review, to look
10 closely at several of the intersecting aspects of
11 external outreach and coordination. To see where
12 efficiencies can be gained while enhancing the overall
13 effectiveness and communications effort.

14 The rest of today's presentation then will
15 focus on these three areas, where the lessons learned
16 review found that there were opportunities to enhance
17 programs and prophecies, based on the lessons learned
18 from the San Onofre event.

19 Gloria Kulesa and Emmett Murphy from NRR
20 will discuss the technical aspects of the actual tube
21 degradation mechanism, and efforts underway to both
22 prevent their occurrence in future steam generators,
23 and help NRC inspectors and reviewers find potential
24 concerns earlier in the process.

25 June Cai from the Office of the Executive

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1 Director of Operations, will talk about actions that
2 have already been taken to work with other agency
3 programs, and incorporate lessons learned from the
4 review of external communications efforts.

5 And Yamir Diaz-Castillo will discuss how
6 the Vendor Inspection Program is reviewing its approach
7 for selecting vendors for inspection.

8 Gloria.

9 MS. KULESA: Thank you, Rebecca. Let me
10 begin with some introductions. I am Gloria Kulesa, I
11 am the Chief of the Steam Generator Tube Integrity and
12 Chemical Engineering Branch in the Office of Nuclear
13 Reactor Regulation. And I'm going to bring you through
14 the discussion on the Steam Generator Technical Review
15 Team's efforts.

16 With me, seated by my side is Emmett
17 Murphy. He is a Senior Materials Engineer within my
18 branch. He was a very key member of the SONGS augmented
19 inspection team, as well as a very key member of the
20 SONGS lessons learned, steam generator technical
21 review team.

22 Now I'm going to begin with the background
23 on this team's effort. As stated before you on the
24 background, the licensee and the vendor determined the
25 cause of the Unit 3's tube-to-tube wear, was in-plane

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1 fluid-elastic instability of the U-bends associated
2 with aggressive thermal-hydraulic conditions. This
3 combined with the lack of effective in-plane support
4 of the U-bends.

5 The team's approach. First I will
6 acknowledge the membership of the team. They come from
7 various offices amongst the Commission, representing
8 operating, and new reactors, research, and Region IV.

9 The staff was chosen for their technical
10 knowledge of the steam generator design and operation.
11 And their involvement and the inspection activities
12 related to this event.

13 The team's approach was to review relevant
14 documents. You see a partial listing of them behind
15 me. They also looked at operating experience.

16 Over the next five slides, I will cover the
17 conclusions and actions that the Executive Director of
18 Operations tasked this team to review and consider.

19 The first item is the additional NRC
20 guidance needed for steam generated design,
21 replacement, or modification.

22 The team started with the review of
23 regulatory documents. Since regulations form the
24 basis to address the adequate protection of the
25 public's health and safety. This encompassed the

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1 review of regulatory guides, and standard review plans.
2 As these documents provide the methods to meet the
3 regulations.

4 And the review, the team noted that there
5 was a lack of specifics in the current guidance related
6 to fluid-elastic instability of the steam generator
7 tubes.

8 The team focused on the need to change the
9 regulatory guidance as it relates to the tube vibration
10 that can lead to the damage from this phenomena. And
11 the team took a two-tiered approach for considering.

12 The first is a general process that would
13 identify qualitative considerations that a reviewer
14 could use to determine whether a steam generator design
15 is bounded by a proven design.

16 And if necessary there would be a second
17 tier and that would provide more detailed review
18 guidance on that. So the action for the first item of
19 consideration was to write this two-tier approach
20 guidance.

21 MEMBER POWERS: I'm not sure how you've
22 bound vibrations?

23 MS. KULESA: Excuse me?

24 MEMBER POWERS: I'm not sure how you bound
25 vibration? You said, you were bounded by a proven

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1 design with respect to vibrations, then they're fine.
2 If not, then they go to this more detailed -- I'm just
3 not sure how you go about bounding with respect to
4 vibration?

5 MR. MURPHY: This is Emmett Murphy,
6 NRR/DE. Three years ago you had your representatives
7 of St. Lucie, and this was in the aftermath of SONGS.

8 MEMBER POWERS: Right.

9 MR. MURPHY: And a natural question was,
10 what is your vulnerability? What is St. Lucie's
11 vulnerability to similar type occurrence? And St.
12 Lucie of course did not have a mathematical, you know
13 model for us to say, this won't occur. But St. Lucie
14 identified to you a whole list of qualitative
15 comparisons, in terms of void fraction, circulation
16 ratios, so on and so forth.

17 And the takeaway from that was that, while
18 the subject of fluid-elastic instability in a
19 particular in-plane U-bend instability, while the
20 state-of-the-art and our understanding of the
21 phenomena is still not very well developed, there
22 seemed to be less much, you know significantly less
23 potential for this type of occurrence at St. Lucie than
24 at SONGS.

25 And I think that's what we're talking about

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1 here in this first flush, first stage, review. I mean
2 a particular vendor may have developed, you know, built
3 15 different steam generators. And for a given vendor,
4 you know some of the plants have a more aggressive
5 thermal-hydraulic environments than others, more
6 benign.

7 You look at span lengths between supports,
8 there are many qualitative comparisons you can make to
9 see whether the steam generator of interest is, how it
10 compares with its brethren. And what the performance
11 of those other generators has been.

12 And you would take some degree of
13 confidence from the fact that you're operating within
14 a known envelope.

15 MEMBER POWERS: It's really not bounding.
16 It's really going by analogy. I can't come in with my
17 Slovakian generator and say it's bounded by Mitsubishi
18 generator. I have to, I have to know something about
19 Slovakian generators and their performance.

20 MR. MURPHY: These kind of qualitative
21 comparisons are best made among steam generators from
22 the same --

23 MEMBER POWERS: Understood. So if you
24 had analogy, it's not so much --

25 MR. MURPHY: You have to be insightful in

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1 drawing your comparisons and understand sometimes you
2 may be mixing apples and oranges, no question.

3 MEMBER POWERS: You've got to have
4 similar, some similarity of design philosophy to
5 extrapolate or interpolate here.

6 MEMBER CORRADINI: So to ask Dana's
7 question, to how many, you go from Tier 1 to Tier 2,
8 who was identically the same design, but a higher fail
9 rate?

10 MEMBER POWERS: Well --

11 MEMBER CORRADINI: -- because at least in
12 this example, you're using --

13 MR. MURPHY: You know, we can't, we're not
14 prepared to be specific at this time. You know that
15 we're the -- we think in general that you know, the first
16 tier review would generally be sufficient.

17 The problem that we had at San Onofre was
18 a unique occurrence after decades and decades of PWR
19 experience. When one decides you know, what kind of
20 you know, how much more review guidance we want to
21 provide for, you know we had to consider the values and
22 the impacts versus the expected, you know, what's the
23 safety improvements we're going to get for the
24 additional effort. These are all part of what we'll
25 consider.

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1 MEMBER REMPE: So to summarize and
2 paraphrase, I think what I hear you say is, you're not
3 ready to, ultimate conclusions, but you're thinking of
4 not only bounding conditions but also looking at the
5 vendor experience and the proposed design? Or are you
6 just looking at conditions?

7 MR. MURPHY: We would consider the, well
8 you know the industry-wide operating experience as well
9 as the vendor experience. We would draw, you know as
10 many meaningful qualitative comparisons as we could to
11 assess -- you know there's always a challenge faced
12 by the bigger applicant in having a generator that will
13 perform adequately.

14 MEMBER REMPE: Thank you.

15 MEMBER SCHULTZ: Emmett, I think what
16 seems important from this discussion is that, if it's
17 described as an overview, qualitative evaluation, that
18 is a first cut to determine whether additional work is
19 done. That can give one impression.

20 When you describe what that would be based
21 upon your experience, and the number of things that you
22 described would be appropriate to exam. You made it
23 sound a lot more like a detailed review in a first cut
24 kind of way.

25 But you really described the evaluation as

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1 one which was, as I said before, based on your
2 experience. You know that one needs to look at, and
3 you mentioned five or six things off the cuff that you
4 would exam for this part of the evaluation.

5 I think it's important to get that message
6 across, that part A of the evaluation is not a
7 qualitative evaluation to see whether this generator
8 is like another. But it's really I think, from what
9 you've described you would do, a very detailed level.

10 MR. MURPHY: Well we haven't made any
11 conclusions you know. And not really prepared to
12 discuss specifics of what we would be doing.

13 MEMBER SCHULTZ: Yes, but as you get to
14 that, I think the way in which it's presented is
15 important. Because you're talking about review
16 guidance here. And so it's important to capture what
17 that means in terms of who does the review, the
18 experience base, the level of detail of investigation
19 associated with it.

20 MEMBER CORRADINI: Can I ask each
21 questions differently. So is it fair to characterize
22 Tier 1 as qualitative and Tier 2 as more quantitative?

23 MS. KULESA: More detailed would be --

24 MEMBER CORRADINI: Yes, but I mean, so let
25 me give you my example. My example is, I have vendor

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1 X that provides steam generators. And then somebody
2 comes in and says, it's vendor Y. Same geometry, same
3 quality but vendor Y. But then at least in this case,
4 what I hear is I had vendor Y, plus I had a different
5 geometry, plus I had an increased flow.

6 So at what point, so what I'm trying to get
7 at is, is it a qualitative look at it and then after
8 I get a qualitative look, and I have three changes to
9 it that staff wants to think about more. Then you
10 become more quantitative as to where you are relative
11 to past experience? I'm still trying to understand the
12 two tiers.

13 MR. MURPHY: Well you know, I can't give
14 you a good distinction at the present time about the
15 two tiers. We're not prepared to talk about that.

16 MEMBER CORRADINI: Okay, that's fine.

17 MR. MURPHY: I think as Gloria put it, a
18 second tier, if found to be necessary to go into would
19 be more detailed. I --

20 MEMBER CORRADINI: I have another
21 question to help you out. So let's say staff looked
22 at it and it was same vendor, same geometry, higher flow
23 rate, and there was no leakage, but you saw excessive
24 wear? Is that even an issue for NRC, or is that just
25 an investment protection issue that the utility's got

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1 to deal with?

2 MR. MURPHY: Well, first you know, I'm not
3 sure what kind of process we'd be in for the situation
4 you just described. It sounds like a generator that's
5 already operating.

6 MEMBER CORRADINI: Well, my only, I'm just
7 trying to think of abstracting into how you would decide
8 whether I would look more deeply? That's what I'm
9 trying to get at.

10 And even if you look more deeply, or let's
11 say you had to pass on it, and it goes into operation
12 and I get excessive load but I don't get leakage, that's
13 not necessarily a safety issue is it?

14 MR. MURPHY: That type of situation that
15 you described should be managed by the SG Program in
16 the specifications.

17 MEMBER CORRADINI: Okay.

18 MR. MURPHY: The kind of problem that
19 we're dealing with here is a basic design or fabrication
20 flaw that results in very rapid impairment of tube
21 integrity. Something that can't be managed by
22 periodic in-service inspection.

23 MEMBER CORRADINI: Okay.

24 MEMBER SKILLMAN: Emmett, let me make a
25 comment and then ask a question. The interesting

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1 characteristic of the steam generator is, it is at the
2 same time, reactor cooling system pressure boundary,
3 and also secondary site boundary. So it's the
4 assembled component that has these two very important
5 boundary design formations.

6 In this case, a change was made. A
7 seemingly insignificant one that turned out to be very
8 significant. And so I'm wondering if for the rest of
9 our meeting today, we could be discussing this issue
10 on two tiers.

11 One, is the what is at San Onofre, what
12 you've discovered in your lessons learned on the
13 generators. Then at a different level, this could be
14 a discussion on reactor coolant pump internals. This
15 could be a discussion about reactor vessel internals.

16 It could be a discussion about the change
17 made to fuel, but not discovered until after the fact.
18 And so for at least this one Member's perspective, this
19 event is a goldmine in terms of discussing how to
20 prevent importation of latent defects.

21 And I would offer this as a perfect example
22 of a latent defect. It got imported. It got
23 engineered to the hilt. All the thought, all the
24 details were what they needed to be for the rest of the
25 plant life. And here we had basically a failure of the

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1 reactor cooling system pressure boundary.

2 Could we through these discussions, talk
3 about two levels? The San Onofre event, but also what
4 thinking might be in the back of the NRC's mind to
5 prevent this type of event from happening anywhere else
6 in procurement land?

7 (Off the record comments)

8 MEMBER SKILLMAN: And I'll bring your
9 attention, the one thing I'm kind of holding onto here,
10 is this Criterion III, in this Appendix B, the 10 CFR
11 50. It is the tail end of Criterion III.

12 Design changes, including field changes,
13 shall be subject to design control measures
14 commensurate with those applied to the original design
15 and be approved by the organization that performed the
16 original design unless the applicant designates
17 another responsible organization.

18 (Off the record comments)

19 MEMBER SKILLMAN: I can interpret that
20 paragraph, I think from the perspective of Mitsubishi
21 and the owner, as having been complied with. But I
22 could also take a fairly aggressive view, and say, now
23 wait a minute. That was a change. And unless all the
24 details of that change were fully understood, that
25 change didn't pass muster.

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1 So again, what I'm suggesting is please
2 talk about the lessons learned from San Onofre. But
3 if you can, project how the NRC is thinking about how
4 these lessons learned are at a different level in terms
5 of prevention of importation of a latent defect.
6 Because I think that's the real lesson here.

7 MR. LUBINSKI: If I could, John Lubinski,
8 Director of Division of Engineering. And I appreciate
9 the comment and I think as part of our presentation
10 today, you'll hear about vendor inspection.

11 And with respect to that topic, the vendor
12 inspection will be looking more broadly, not just how
13 do we inspect steam generators. But with respect to
14 the specific topic, in asking Emmett and Gloria the
15 question, this specific topic really was on the steam
16 generator reviews.

17 So if I take what you had as far as two
18 issues, I'd say maybe three issues. One, is specific
19 to SONGS, and what did we learn out of SONGS. The
20 second level is what do we learn out of SONGS with
21 respect to Steam Generator Technical Reviews.

22 And that's where Emmett and Gloria are
23 right now.

24 MEMBER SKILLMAN: Right, I see that.

25 MR. LUBINSKI: And they're not going

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1 beyond that to say, have we looked as part of this
2 review, at how we review all of the larger components?
3 If you will, as you said whether you're talking about
4 different pumps, different valves, steam dryers, so
5 that's I'd say from a question standpoint, more
6 appropriate in the vendor area.

7 What are we doing in the vendor area, what
8 are we doing in the vendor area to look at those type
9 of component vendor inspections?

10 Whereas this is what did we learn from a
11 steam generator review guidance? Because again, as
12 you said, it's a very important component. And looking
13 beyond just what happened at SONGS, how are we taking
14 those lessons and expanding it to steam generators?

15 MEMBER SKILLMAN: Thank you, John. Thank
16 you, Emmett.

17 MEMBER POWERS: Well, I can be sympathetic
18 but we need to focus in. Dick looks at this as,
19 something importing defect, I think is the term you
20 used. I tend to look at it as, one of those peculiar,
21 how to define first of a kind engineering?

22 The way I look at it.

23 And I know how the Rand Corporation
24 defines first of a kind engineering? It's not that's
25 the time something's been built, it's the first time

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1 you built it.

2 And that's why, maybe it comes to the same
3 thing. It strikes me, that the agency needs to be able
4 to flag when they're encountering first of a kind
5 engineering.

6 MEMBER CORRADINI: Say that louder again,
7 Dana, I'm sorry.

8 MEMBER POWERS: The agency needs to be
9 able to flag when it's encountering first of a kind
10 engineering.

11 MEMBER REMPE: I think this will come up
12 under Topic 8, but I agree with you, because it's my
13 understanding what we were reading, is that they do spot
14 checking under Topic 8 at this time.

15 MEMBER SKILLMAN: Thank you.

16 MS. KULESA: Thank you. So on to the next
17 item consideration, Number 2. And that was does the
18 agency=s Steam Generator Program effectively handle
19 new degradation mechanisms?

20 CHAIRMAN RICCARDELLA: I'm sorry to
21 interrupt.

22 MS. KULESA: You're good.

23 CHAIRMAN RICCARDELLA: But you know, we
24 talked about this two-tier process under Question 1.
25 And I heard a lot about the first tier. I didn't hear

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1 anything about what that second tier would involve if
2 you trigger it?

3 MR. MURPHY: Again, we're --

4 (Simultaneous speaking)

5 CHAIRMAN RICCARDELLA: -- setting up
6 models, new models?

7 MR. MURPHY: -- we're not prepared to
8 discuss the second tier today.

9 MS. KULESA: Right. This is still in
10 staff deliberations, Peter. We're working on this
11 right now. I'm looking at what guidance there is out
12 there. And we've identified over the past several
13 months, areas where we could see needed to be addressed.

14 But we really don't have hard and fast
15 things that we wish to share. We wanted to do it
16 community wide first within our staff level. And then
17 come back, provide more accurate details when we're
18 done.

19 Peter, really what's coming out of this,
20 and if you would bear with me, there's going to be a
21 point where you can hear more of the details. We're
22 a little bit ahead of the curve on some of the
23 discussions that are coming up to that. So you could
24 hear me repeat the same part of information again.

25 But where we stand on this, it weighed

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1 whatever the document is that we're adjusting, putting
2 guidance out or something like that, we're going to
3 follow our NRC processes. And our NRC process might
4 actually have us before you again.

5 So if we're changing a regulatory guide,
6 we might be before ACRS with the discussion and Kent
7 is acknowledging that over there from his experience
8 base. So what I want to say is, even though we can't
9 give you many details today, I believe we may have the
10 ability to come back again.

11 And I understand there's interest here, so
12 even if there's a topic that we would not by process
13 come to you, if you're interested in this we would be
14 very willing at that time to come back and give you more
15 details. But not at this stage tonight.

16 CHAIRMAN RICCARDELLA: Sure. So let me
17 maybe paraphrase. So the lessons learned report
18 defines a series of actions. But you haven't taken
19 those actions yet.

20 MS. KULESA: We're in the process --

21 (Simultaneous speaking)

22 CHAIRMAN RICCARDELLA: You're defining
23 those actions.

24 MS. KULESA: -- but this is not where we're
25 reporting out, we're done. We're still a work in

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1 progress and this is really months still to come.

2 And I think you're going to hear that
3 message repeated in each of these items that I'm
4 covering.

5 CHAIRMAN RICCARDELLA: I still, I'm
6 wondering what are you thinking in terms of that? I
7 mean are you thinking of getting into the actual
8 confirming the detail design that's performed by
9 vendors?

10 I mean does NRC really have the staff and
11 the budget to do that?

12 MR. MURPHY: Or the need?

13 CHAIRMAN RICCARDELLA: What?

14 MR. MURPHY: Or the need?

15 CHAIRMAN RICCARDELLA: Yes, that too.

16 As opposed to enforcing the regulations on
17 the licensee and the vendor?

18 MR. MURPHY: Well this is all part of what
19 we're trying to evaluate under this particular item.
20 That you know, what should we be doing? What can we
21 be doing? Are these consistent with the values and the
22 impacts?

23 CHAIRMAN RICCARDELLA: So Tier 1 is fairly
24 clear what you're going to do. You're going to look
25 at you know, whether the design basically is beyond the

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1 envelope of successful industry experience.

2 And if it's not, or if it is beyond the
3 envelope, then that would trigger the Tier 2, but you
4 haven't really defined what Tier 2 is going to be.

5 MR. MURPHY: That's correct.

6 CHAIRMAN RICCARDELLA: Okay. Thank you.

7 MR. MURPHY: And incidentally, you know
8 with Item 4, you know we'll be talking about the fact
9 that the state-of-the-art you know, needs some work.
10 And that's a related issue.

11 MS. KULESA: He's two steps ahead of me at
12 this moment.

13 CHAIRMAN RICCARDELLA: Okay, thank you.

14 MS. KULESA: All right. So as I am
15 addressing the second item of consideration here. I
16 want to address this one along with item of
17 consideration Number 3.

18 So I'm going to ask Rebecca to move to the
19 next slide. And the reason why I am doing that, these
20 considerations are very related. One being a subset
21 of the other, if you notice on Item 3, I'll just read
22 the consideration.

23 Does the existing Steam Generator Program
24 effectively account for fluid-elastic instability?
25 So you hearing between the two, that they are both

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1 addressing the Steam Generator Program. And they're
2 both talking about a degradation mechanism, one more
3 specific.

4 Stay on this slide, Rebecca. All right,
5 so let me give some, a little bit more details on this.
6 Certain degradation mechanisms can be effectively
7 managed through a normal in-service inspection. But
8 there are some that cannot. And that can be those that
9 rapidly propagate.

10 You heard Emmett make those remarks
11 earlier. And that is the example, fluid-elastic
12 instability. As a result, some degradation mechanisms
13 must be precluded in design. You know, if I were to
14 like to preclude all degradation mechanisms in design,
15 we recognize that some will occur. And they will be
16 managed through the In-service Inspection Program.

17 As a result, the team concluded that the
18 Steam Generator Program manages degradation mechanisms
19 effectively. However, in the case of fluid-elastic
20 instability, it must be precluded by design. Because
21 it is fast growing and there are high uncertainties in
22 the growth rates.

23 From the safety perspective, if such a
24 rapidly propagated phenomena should occur, and I've a
25 bullet on this, that the operational leak rate limits

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1 in the technical specifications and the established
2 steam generator tube rupture emergency procedures
3 should ensure that public health and safety are
4 maintained.

5 Therefore the team does not recommend any
6 further actions to items of consideration Number 2 or
7 Number 3. Because the team believes the program is
8 effective for the types of mechanisms it was intended
9 to address.

10 I'm on to consideration Number 4, that
11 states, does the agency or industry need additional
12 standards for new or replacement steam generators?
13 I've already addressed the Agency's side when I spoke
14 of Item Number 1. So at this time, I will now address
15 Industry's actions.

16 At least twice a year, NRC meets with
17 representatives from Steam Generator Industry. Our
18 last meeting occurred in February. At that meeting,
19 Industry discussed their plans to generically
20 investigate the onset of in-plane fluid-elastic
21 instability through a series of tests at the Canadian
22 Nuclear Laboratories.

23 This is where the Canadians are doing some
24 of their own testing. I believe contracts are going
25 in place right now. The work will begin in 2015 and

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1 this is a three year effort.

2 MEMBER POWERS: What laboratory is that
3 being done in?

4 MS. KULESA: Excuse me, Dana?

5 MEMBER POWERS: What lab is that being
6 done in?

7 MS. KULESA: Canadian Nuclear
8 Laboratories?

9 MEMBER POWERS: Chalk River, you mean?

10 MS. KULESA: I had, this coming from
11 Industry, I got the letter and that's how they
12 identified the name of the laboratory.

13 MEMBER POWERS: Well if CNL's the name,
14 CNL's the new, fancy name.

15 MS. KULESA: Okay. I'm not familiar with
16 its former identification.

17 MEMBER POWERS: And where they're doing
18 it, I would bet, Sheridan Park or --

19 MALE PARTICIPANT: I know we have a
20 representative from Industry.

21 MR. KAMMERDEINER: Right, Greg
22 Kammerdeiner, I'm representing the Steam Generator
23 Task Force. I'm First Energy, it's the former Chalk
24 River Facility.

25 (Simultaneous speaking)

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1 MEMBER CORRADINI: That's its new name.

2 MEMBER POWERS: The only trouble is --

3 (Simultaneous speaking)

4 MEMBER POWERS: The only trouble is they
5 think everything's horizontal. We think it's
6 vertical.

7 MS. KULESA: Okay. A prediction of the
8 final result, the solution of this effort is difficult.
9 The goal is to understand what leads to the onset of
10 fluid-elastic instability.

11 And Industry recognizes that this a
12 learning effort. They will adjust, they will stop at
13 various phases depending upon the results that they
14 see.

15 In a separate action, the Electric Power
16 Research Institute, known as EPRI, are developing a new
17 state-of-the-art steam generator thermal-hydraulic
18 code, called Triton. This is expected to be an
19 additional assessment tool for considering potential
20 changes in the thermal-hydraulic conditions of
21 operating steam generators.

22 This is as a result of two parking power
23 uprights and or both ups of deposits on the secondary
24 side of the steam generator. Also EPRI has initiated
25 work on a flow vibration analysis package which is

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1 expected to help estimate wear, EPRI usage rates for
2 steam generator tubing. Knowledge from the Canadian
3 Nuclear Laboratory is expected to be included into that
4 analysis.

5 And lastly, the American Society of
6 Mechanical Engineers, known as ASME, has a Task Group
7 on Flow Induced Vibration. The group meets every three
8 months. It's a consensus codes and standards effort.
9 We believe this to be a multi-year activity. We
10 actually have staff on this team as well.

11 So in conclusion, for our item of
12 consideration forum, we will continue to engage
13 industry on the design and fabrication, standards and
14 guidance to minimize the potential for in-plane
15 fluid-elastic instability in a steam generator.

16 MEMBER POWERS: Does NRC have input into
17 the testing that'll be taking place?

18 MS. KULESA: Dana, you're coming very
19 softly, so that I --

20 MEMBER POWERS: Oh, I do that out of habit.

21 MS. KULESA: I'm sorry, sometimes I either
22 have to ask you to speak up or I could try to repeat
23 what I Dana was saying.

24 MEMBER POWERS: I was just wondering if
25 the NRC has input into the testing that's going to take

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1 place in Canada?

2 MR. MURPHY: Not that I'm aware. They
3 have the benefit of reading staff comments that were
4 made in the context of San Onofre and the available
5 testing and retesting at that time.

6 MR. LUBINSKI: John Lubinski, if I could
7 add to that. As Gloria said, we do meet with the Steam
8 Generator Task Force every six months. And the
9 expectation is they will be updating us during those
10 meetings on the testing. And that's usually an
11 interactive session where we ask questions along the
12 way.

13 So it's not really input, but if we have
14 questions that may be of insight to them, they'll get
15 those during those meetings.

16 MS. KULESA: And what I might add onto
17 John's statement is basically we communicate with those
18 in generator industry, not just through the various
19 official meetings that we have. We also communicate
20 emails and the like in between. So there is not just
21 a once or twice during the year exchange of information.

22 MR. KAMMERDEINER: Greg Kammerdeiner
23 again, First Energy, we will have an expert panel to
24 develop the test configuration. But it was not our
25 intent to specifically solicit NRC input in that panel.

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1 But as was stated, the twice a year meetings will be
2 provided an update, and NRC will provide feedback at
3 that time.

4 MEMBER CORRADINI: Is this an
5 international effort? Or just U.S.?

6 MR. KAMMERDEINER: I believe at this time
7 it's just U.S.

8 MEMBER SCHULTZ: Who is on the team, Greg?

9 MR. KAMMERDEINER: I can't tell you that
10 at this time. I think we're still putting that team
11 together.

12 MEMBER CORRADINI: So it's still being
13 assembled?

14 MR. KAMMERDEINER: I believe so, yes.

15 MEMBER POWERS: Kind of surprises you when
16 there's no activity in this area in France doesn't it?

17 MR. KAMMERDEINER: Why? I would, I
18 agree.

19 MEMBER POWERS: As well you should.

20 MEMBER CORRADINI: Well, I mean you said
21 it so I can't.

22 CHAIRMAN RICCARDELLA: And the ASME Task
23 Group, that Gloria was referring to, is that Section
24 3 or Section 11?

25 MS. KULESA: Three.

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1 CHAIRMAN RICCARDELLA: So it's design,
2 Appendix N, I take it?

3 MS. KULESA: Yes.

4 CHAIRMAN RICCARDELLA: Okay, thank you.

5 MS. KULESA: And onto my last presentation
6 slide. And this is the item of consideration for our
7 enhancements to the Agency's Steam Generator
8 Inspection procedures needed. And I'll read the
9 statement, that we have on the slide to begin with. And
10 the answer is Yes. The staff will revise the pertinent
11 inspection procedures to ensure the two-tiered
12 guidance discussed in Item 1 can be applied during the
13 inspection and oversight process.

14 But I also could add to that remark that
15 there are instances where the licensees can make a
16 change to the steam generator without requiring a
17 submission of the license amendment.

18 So it's possible that the change could
19 affect the steam generator's susceptibility to
20 fluid-elastic instability. So as a result, the
21 guidance is needed for the inspector to use, better
22 guidance. And what we identified in Item 1, we said
23 we would make sure that this is consistent with the
24 guidance that we're also providing for the inspectors,
25 the inspection procedures.

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1 MEMBER SKILLMAN: Can you go into any
2 further detail?

3 MS. KULESA: Not at this moment, I'm
4 sorry, Gordon. Like I said this is all very early
5 stage. As far as I'm just reporting out the facts and
6 intents of the team, and our, pretty much the direction
7 that we wish to go.

8 MEMBER SKILLMAN: Okay, thank you.

9 MS. KULESA: All right, well that
10 concludes my remarks for the Steam Generator Technical
11 Review. And I will then turn the discussion now to
12 June.

13 MS. CAI: Thank you. Good afternoon. I
14 will be focusing on the Agency's External Communication
15 Interactions.

16 As Rebecca mentioned, at the introduction,
17 there was significant external interest during the
18 extended shutdown from a variety of stakeholders,
19 including Congressional, state, and local elected
20 officials, the licensee, non-governmental
21 organizations and members of the public.

22 In responding to this large amount of
23 interest, the Agency conducted a number of
24 communications efforts. And formed a group comprised
25 of staff from across the Agency, focused on

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1 communication.

2 This group spent significant resources and
3 efforts conducting various communication activities
4 and keeping products up to date. These types of
5 communication outreach activities were not part of
6 NRC's routine oversight processes. And available
7 procedures provided only limited guidance to the staff.

8 So this review is focused on improvements
9 that could be made to Agency processes to use, make more
10 effective and efficient use of Agency's resources for
11 conducting outreach and communications for future
12 situations.

13 Because of the scope of this review
14 centered on the Agency's internal processes, most of
15 the input collected came directly from NRC staff and
16 managers who had a direct involvement with the
17 communication activity.

18 NRC's focus groups were held with current
19 NRC staffing managers from multiple offices.
20 Interviews were also conducted with some former senior
21 managers, who have since retired. As well as
22 facilitators for several of the public meetings.

23 A variety of documents were reviewed
24 including communication plans, blog posts, press
25 releases, public websites, public meeting documents,

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1 meetings presentations, and meeting feedback forms.
2 There were also some recordings of the public meetings
3 which we reviewed.

4 We supplemented the internal data sources
5 with some external data collection efforts, including
6 an online survey that was sent out to approximately 140
7 individuals had interactions with the NRC during the
8 extended shutdown, for whom staff kept contact
9 information.

10 And of those 140 invitations, we received
11 25 responses and 4 additional individuals provided more
12 detailed written responses.

13 And the survey focused more on the areas
14 that the staff had direct interactions with the public,
15 which included the public meetings, NRC blog, and the
16 public website.

17 In addition, I traveled out to San Onofre
18 in October of 2014, during a public meeting we had on
19 decommissioning, interactive with stakeholders and
20 attendees at that meeting who attended some of the
21 previous meetings, to get their insight.

22 MEMBER POWERS: It says you got a lot of
23 unusual interactions with interested people. What I
24 don't understand is why were they asking you questions?
25 I mean you didn't design the steam generator, you didn't

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1 operate the steam generator or --

2 MS. CAI: Yes.

3 MEMBER POWERS: What were they asking you?

4 MS. CAI: Well they, there was a lot of
5 interest on shutting the plant down permanently. So
6 you know, we were under the process of eventually
7 determining if they would be.

8 We felt that comfortable letting them
9 restart. You know, authorizing the restart. So there
10 was a lot interest in shutting them down permanently
11 and not allowing them to restart.

12 There was also a very high level, you know
13 in Southern California, high level of clean concerns
14 on nuclear power, anti-nuclear views. So those were
15 also in play as well.

16 MEMBER POWERS: So I know that's different
17 from two years ago, or five years ago. The faulty
18 generator, they had exactly the same number of people
19 interested in exactly the same subjects.

20 So you really weren't talking to, about
21 steam generators. That was just an excuse to ask you
22 the question.

23 MS. CAI: In some cases, yes. In some
24 cases if you watched some of the public meeting
25 recordings, or look through the records, you know

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1 people came -- and this will be covered on when the
2 public meeting discussion points.

3 You know, people didn't necessarily come
4 to talk specifically on the topic at hand. They might
5 have previous you know, statements they had planned to
6 make. Or previous views that you know they were using
7 as a platform to share --

8 MEMBER POWERS: Yes, I suspect few of your
9 interlocutors had a clue what fluid and elastics and
10 the instability was.

11 MS. CAI: Yes, it is interesting, the
12 recordings are out there. It is quite interesting
13 because sometimes you'll see a disconnect between the
14 comments already made, especially a lot of members of
15 public versus technical topics that were being
16 discussed. So we'll go into some of that when we talk
17 about the public meeting enhancements.

18 MEMBER POWERS: Well it just strikes me
19 also as interesting, that the part of your outreach,
20 you didn't outreach to the technical community that
21 does know what fluid and elastics instability is.

22 MS. CAI: I, don't know that level of
23 specificity. I know that you know, between NRR and the
24 Regions, they did interact with a lot of different types
25 of groups.

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1 I don't know if they, you know outreach
2 that specific. I focused more on just the general
3 public outreach efforts.

4 Okay. So the central takeaway from all
5 the information --

6 MEMBER POWERS: Well maybe I get,
7 interrupt you again and just comment, that a former
8 Chairman of the ACRS once took the position, which I
9 think I agree with, is that in new regards, the academic
10 community is the public's representative on these very
11 technical issues.

12 MS. CAI: Yes. Thank you.

13 So the central takeaway, so the main thing
14 we heard from the staff feedback was that this level
15 of communication effort consumed significant
16 resources. Especially from the technical staff, that
17 exceeded what had been anticipated or budgeted for in
18 advance.

19 In general, the support fell on technical
20 staff as collateral duty, which took away from doing
21 technical work. And having individuals with specific
22 communications expertise help in such efforts, could
23 have provided some efficiencies and led to more
24 effective communication products.

25 Would also have allowed technical

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1 expertise to remain more focused on the technical
2 issues. Again, this would have been, allowed for more
3 efficiencies and resulted in some more effective
4 communications.

5 Overall, the external feedback received
6 was generally positive once respondents were
7 questioned directly about NRC's communication efforts.
8 i.e., independent of their views on SONG or nuclear
9 power.

10 So that was, you know I just wanted to make
11 that clarification. If, there were you know, some
12 negative feedback in general about some of our efforts.

13 But overall, it was actually surprisingly
14 positive once you focused the feedback on, okay, this
15 public meeting, this website, this blog. You know, put
16 aside your views on nuclear power and SONG. So, and
17 that was interesting finding.

18 And many of the individuals that we
19 interacted with from the external, the stakeholders,
20 expressed very positive interactions with NRC staff and
21 the facilitators for the public meetings.

22 There were some concerns noted, some
23 example included, there was two little opportunity for
24 interactive communication. The timeliness of
25 information sharing could have improved. And the

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1 information could have been presented in plain language
2 to be more understandable.

3 MEMBER POWERS: There's many of us that
4 wish thermal hydraulics was written in plain language
5 and more understanding.

6 MS. CAI: It's challenging stuff. Yes.

7 (Laughter)

8 MS. CAI: Okay, so --

9 (Simultaneous speaking)

10 (Laughter)

11 MS. CAI: So the public meeting was the
12 bulk of the efforts and so I have a little bit more
13 extensive information on the public meeting.

14 So there were a total of eight public
15 meetings held during the extended shutdown, four in
16 California and four here at headquarters.

17 As I mentioned, external stakeholders
18 didn't only appear to be satisfied with the staff and
19 facilitator performance at these meetings, but they
20 offered some suggestions and recommendations.

21 One of the things that we heard from staff
22 was, in future situations, Agency should consider using
23 other formats. For example, open house format in
24 which, that's held with a specific purpose of listening
25 to the attendees.

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1 This type of format would allow more
2 opportunity for dialog exchange. With the attendees
3 to be able to provide their views. And be done in a
4 more informal conversational setting.

5 There was also a suggestion to bypass the
6 sometimes lengthy introductory remarks and
7 presentations and move directly into a facilitated
8 question, answer sessions. And make the best use of
9 the time.

10 This next one gets a little bit --

11 CHAIRMAN RICCARDELLA: Introduction by
12 the NRC, or the staff?

13 MS. CAI: It's staff, yes. Because you
14 know a lot of the meetings they might have several staff
15 or a panel you know. And everybody gets their ten or
16 fifteen minutes, but then they end up running over.

17 So it's a two hour meeting, so the public
18 ends up sitting there you know for the first hour, hour
19 and a half just listening to presentations. And then
20 they only have a short portion for Q&A. And so the
21 suggestion is, just set it up to be very interactive.

22 CHAIRMAN RICCARDELLA: And this feedback
23 came from the external stakeholders, or some of both?

24 MS. CAI: So also internal as well, both.
25 Yes. They said, you know for the public especially,

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1 people often traveled very far. It took a long time.
2 And said, I don't want to just come and sit here for
3 an hour listening to, you know very technical, really
4 I don't even know what they're talking about.

5 I'm here with my two, three questions and
6 I really you know, want to ask them and have the
7 discussion, so.

8 So the next one was interesting, conveying
9 the meeting purpose more clearly. And this kind of
10 gets at some of the ones that Dana made.

11 So that really emphasized the need to be
12 more clear, to convey more clearly to the participants,
13 to the public, on the purpose of each meeting.

14 Because many of the attendees who came to
15 the meetings viewed them as some type of hearing. They
16 wanted to make statements "for the record," quote, in
17 quotes. And then give input to NRC for our decision
18 making process, for deciding the restart.

19 So the staff emphasized, we need to be more
20 clear in conveying that these are informational
21 meetings. You know, we're presenting information,
22 answering questions. But staff is not in the position
23 to take inputs for decision making. And it's not any
24 type of formal hearing process. So there was that
25 disconnect.

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1 MEMBER CORRADINI: Do you think, I
2 appreciate you're saying, but do you think when
3 anything is occurring in nuclear power, do you have
4 anything but this sort of reaction?

5 I mean this is kind of back to Dana's point.
6 This is always there.

7 MS. CAI: Yes.

8 MEMBER CORRADINI: The event caused it to
9 essentially become, certain things occurred, but does
10 this surprise you?

11 MS. CAI: No. I don't think anybody was
12 surprised, but I think we're looking for ways to --
13 because we would expect this level of interest, if
14 something similar happened we probably would see a
15 similar level of interest -- to better plan for it, to
16 better handle it.

17 And I'll talk about it a little bit later,
18 there's a public meeting effort. And so some separate
19 efforts to improve public meetings.

20 And so we felt some of these lessons were
21 anti to the effort. And the thinking there is to better
22 manage, like disruptive behaviors, and keeping people
23 focused on the topic at hand. Things like that to help
24 mitigate and try to, you know bring the meeting back
25 to the focus and --

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1 MEMBER POWERS: If you've got some keen
2 insights on that, we could use them here.

3 (Laughter)

4 MEMBER CORRADINI: Yes. We're always on
5 task.

6 MS. CAI: Think that.

7 MEMBER POWERS: I'm being authentic.

8 MS. CAI: The next one was, some of the
9 feedback we heard both internal, external, was for in
10 the future if panels are used, compositions to ensure
11 a broad balanced spectrum of views directly relevant
12 to the topic at hand.

13 And in some of the cases there was
14 perception that the panels that were setup were more
15 focused on negative you know, aspects, versus
16 supporting SONGS or restart, especially with the
17 composition of some of the external speakers. It was
18 skewed more heavily towards the opposition to restart
19 and opposition to SONGS.

20 And some of the speakers didn't
21 necessarily stay on the technical topic or the specific
22 topic of the meeting. So just more recognition that
23 there should be more balance across different types of
24 speakers and views that were presenting.

25 MEMBER SCHULTZ: So this is more of the

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1 what, would be a good way to proceed, not the second
2 part which is how we might want to achieve that?

3 MS. CAI: Right. But I will say when once
4 we get into the actions, these insights I talk about
5 and on the slide, have been incorporated in that
6 separate effort of improving public meetings.

7 We're kind of jumping ahead but I'll just
8 mention real quick. So there's a parallel effort
9 there, the timing worked out really well. This was
10 going on and then there was a parallel effort at looking
11 how the Agency does public meetings. And what are some
12 improvements we can make.

13 So we directly said, as both kind of
14 proceeded, we were able to directly feed the insights
15 from this, and you know many of these that we're
16 discussing, entered directly into that effort. And so
17 that other effort is capturing these points very well.

18 The next one we talked about already.
19 Level of effort had not been anticipated in advance and
20 the technical staff were heavily involved.

21 And many of the tasks, especially the
22 logistical tasks, the technical staff ended up handling
23 a lot of the logistical details. The setting up the
24 meetings, locating venues, and gathering all the
25 webcast and these things. So you know there could have

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1 been other staff to help with that and free them up to
2 more do the technical work.

3 And then the staff ran into a lot of
4 challenges due to the large crowds. And there was a
5 lot of contentious interactions that came into play.
6 So they had to work on it according to security and
7 finding venues.

8 The facilitators also were challenged with
9 the size at times, they were into the several hundreds,
10 even a thousand, and in some cases they were faced with
11 disruptive participants, and contentious
12 interactions. So there was a lot going on.

13 And so some suggestions were made
14 including requests for comments to be submitted ahead
15 of time, so the facilitators could better manage the
16 flow of topics and the use of time.

17 Conducting outreach in advance of meetings
18 to better understand what people's concerns and
19 interests were. And then better planning for
20 overflow, security, and coordinating with the venues.

21 I should mention that ones that were wildly
22 attended, you know, the hundreds, thousands was in
23 California, not necessarily here at headquarters.

24 All right, also with that, a number of
25 other communication efforts and we'll summarize some

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1 of the lessons learned in this slide there. The Agency
2 had been in the process of planning non-public meetings
3 with small groups of stakeholders, but SONGS announced
4 their decommissioning decision before it actually
5 occurred.

6 In talking to the staff, most actually
7 expressed a lot of concern about this type of format,
8 where only certain groups participate in a non-public
9 setting. Because they felt this could detract from the
10 openness and transparency that the Agency values so
11 much.

12 And the selection process would be
13 challenging to ensure you have fair representation and
14 across a diverse group of stakeholders. There were a
15 few people who did feel that it could have been
16 beneficial to allow Agency to better understand
17 different perspectives at a deeper level.

18 Most staff felt that if we were to pursue
19 such meetings in the future, it really will require very
20 careful deliberate consideration of the potential
21 benefit and the resource impact. You really have to
22 weigh the benefits you know, against the cost.

23 In general there was support, or very
24 strong support for government to government meetings.
25 There was some opposed but very positive feedback on

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1 that.

2 The blog was used several times for posting
3 updates and information real-time. The SONGS, really
4 the posts received a lot of interest, a lot of views
5 a hit. So overall, staff thought it was very effective
6 and valuable.

7 The challenge was responding to the
8 comments. The majority of the comments received on the
9 SONGS related posts, were negative. Often they were
10 made by the same small group of people. And the content
11 didn't necessarily provide a useful source of dialog
12 on the topic. So that was a challenge, as a comment.

13 Communication plans were also a useful
14 resource, however they were also very time consuming
15 to keep updated. Also there was recognition that we
16 need better awareness inside the Agency about where
17 current comm. plans are maintained.

18 The group kept updated comm. plans but a
19 lot of people outside the immediate communications
20 group didn't know where to find them, didn't know where
21 they were posted. And there's a central place where
22 internal comm. plans are posted.

23 The external website also was found to be
24 useful, as kind of one stop collection for background
25 information and directing stakeholders there to find

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1 information.

2 But again, keeping the information updated
3 was very resource intensive. It was also challenging
4 to provide in plain language.

5 MEMBER POWERS: I'll just comment that
6 when, at the time the Agency was working very hard on
7 the issue of, some screen blockage. They set up on
8 their website, a portion you could get to very easily,
9 well flagged.

10 We had our technical data, all that
11 corresponded to it, it was really nice. A very
12 technical issue with a lot of interest, from
13 non-technical people who need access to see what
14 research was being done. It was fairly well done.

15 And you know that was one ad hoc kind of
16 thing, largely at the behest of whoever was heading up
17 the effort. It might be a good example when you're
18 dealing with something, terribly technical issue which
19 has a lot of non-technical interest.

20 MS. CAI: Yes. Thank you for that
21 suggestion.

22 MEMBER POWERS: It's just a good example.

23 MS. CAI: Right. Okay. FOIA requests,
24 external correspondence, the staff received a lot of
25 FOIA requests, and external requests for information.

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1 It was very time consuming to respond to all these
2 requests.

3 As far as FOIA is concerned, several
4 recommendations were made, including assigning a FOIA
5 coordinator early in the process. And having better
6 desk top guidance documents to use.

7 And then for the Congressional
8 correspondence, the Office of Congressional Affairs
9 started holding, it was part way through the event, they
10 started holding weekly calls for interest from
11 Congressional staffers.

12 And they found that very helpful actually
13 to cut down on the number of requests. Because you were
14 holding these weekly, and people could just come, the
15 staffers were coming to ask their questions. So that
16 really kind of helped you know reduce the number of
17 incoming requests.

18 MEMBER POWERS: It was technical briefing
19 that they sometimes have for Congressional staffers,
20 often are very good.

21 MS. CAI: Yes.

22 MEMBER POWERS: And I think they find them
23 very helpful.

24 MS. CAI: Yes, so it was very positive
25 feedback on that. Yes.

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1 The other thing that we looked at was, the
2 licensee had setup multiple weekly calls with different
3 levels of NRC staff and managers. So this presented
4 some challenges for communicating clear and consistent
5 messages.

6 So in the future, it was identified that
7 we could have consolidated some of these calls and also
8 we could have benefitted from having a single point of
9 contact for coordinating all the calls for consistency.

10 And then just to make sure everybody is
11 clear on their roles and responsibilities for these
12 calls. So there's no, you know, crosstalk.

13 And then the last thing area we identified
14 was the importance of effective coordination between
15 staff and the Commission.

16 The staff we talked to, felt that
17 Commission communications was most effective when
18 staff was able to provide the Commission with
19 background information, context, and additional
20 insights related to the topic at hand. And the
21 interactions were most successful when procedures were
22 closely followed.

23 And then an overall theme is that a more
24 coordinated effort to engage in more proactive
25 communications, so earlier on, using greater variety

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1 of formats and not just the traditional public
2 meetings, could have been very beneficial.

3 And doing efforts such as these will help
4 us anticipate significant developments and stay ahead
5 of emerging issues.

6 MEMBER SCHULTZ: June, have you got a
7 handle on the resource issue that you raised earlier,
8 yet? Or is that something you're still working on?

9 MS. CAI: That is, let's see, the next
10 slide I think.

11 MEMBER SCHULTZ: Okay, thank you.

12 MS. CAI: Okay, so the actions. So the
13 Number 1 action really is going back to this resource
14 issue. Provide resources to assist technical staff
15 when needs arise. So the Agency could really benefit
16 from this type approach.

17 It would allow staff to be more flexible,
18 adaptable. We could better tailor messages and
19 strategies from the beginning. And then be able to
20 keep our eyes on, in making adjustments as the situation
21 develops.

22 And importantly, it would also allow
23 technical staff to work on the, to focus on the
24 technical work.

25 So implementation, there's two things that

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1 we're pursuing. One, is EDO's office is looking at
2 options for leveraging existing agency communication
3 capabilities, to be able to assist in outreach and
4 communications when needed, on a proactive basis. And
5 using these different variety formats.

6 Now as you know we're all under budget
7 constraints and we are looking at this in the context
8 of what's already available in the Agency.

9 And in addition, we at the end of last year,
10 awarded an Agency-wide contract that can be tapped as
11 needed for facilitation for public meeting and other
12 outreach efforts. So if there's a need for an
13 external, independent facilitator for a controversial
14 meeting, we now have a contract vehicle to be able to
15 lever it.

16 So did I answer your question?

17 MEMBER SCHULTZ: Yes, thank you.

18 MS. CAI: So we are looking into that.

19 Okay, some other activities we're working
20 on, under Topic 7, it talks about revising Inspection
21 Chapter 0351 to incorporate some of these lessons
22 learned. So we have feed the communications related
23 one into that activity. So these, some of these
24 insights we talked about here will be feed into that
25 revision.

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1 I mentioned, so there's been a parallel
2 effort, separate but parallel, there was a task group
3 formed to look at enhancing public meetings. So all
4 the important insights from this effort have been feed
5 into that one.

6 That group completed their initial report
7 at the end of January, and the staff is in the process
8 of developing an implementation plan and plan to
9 provide that to the Commission very shortly, on how to
10 implement some of the recommendations from the Public
11 Meeting Task Group.

12 We're going to be looking to increase
13 awareness and visibility of where our current comm.
14 plans are posted, based on some of the feedback that
15 people didn't know where to find it.

16 And there's also a number of improvements
17 underway for FOIA responsiveness, including better
18 working with the questioners to narrow down the scope
19 of the request, better procedures for handling very
20 larger crowds, better coordination, communication
21 among different FOIA counterparts.

22 Also there was an Agency Working Group that
23 was established back in 2013 to look at FOIA, the
24 Truman-sensitive information, that's subject to FOIA
25 requests. And that Working Group identified some

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1 recommendations and many of those are underway as well.
2 So there's a lot going on there.

3 And that concludes my section.

4 MR. DIAZ-CASTILLO: Good afternoon,
5 everybody. My name is Yamir Diaz-Castillo. And I'm
6 a --

7 CHAIRMAN RICCARDELLA: You know, I think,
8 excuse me for a second. You know we're doing real well
9 on schedule, so I'm thinking maybe calling a break now
10 for about ten minutes. So let's be back at five minute
11 to 3:00.

12 (Whereupon, the above-entitled matter
13 went off the record at 2:44 p.m. and resumed at 2:56
14 p.m.)

15 CHAIRMAN RICCARDELLA: Okay, I assume
16 some of the other Members are going to trickle in. And
17 so why don't we get started, Yamir?

18 MR. DIAZ-CASTILLO: Sure. Good
19 afternoon. My name is Yamir Diaz-Castillo. I am a
20 Reactor Operations Engineer in the Mechanical Vendor
21 Inspection Branch in the Office of Reactors. And I was
22 the team leader for the Vendor Oversight Working Group
23 that was formed in response to the SONGS lessons
24 learned.

25 Prior to SONGS lessons learned we had a

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1 review of the NRC's Vendor Inspection Program.
2 Providing recommendations, if applicable, on vendor
3 oversight enhancements.

4 It's important to note that the licensees
5 are ultimately responsible for the safety of the
6 facilities licensed by the NRC. This includes
7 inspection oversight of its vendors.

8 The NRC's Vendor Inspection Program
9 verifies that a new reactor applicants and existing
10 nuclear power plants that exist are fulfilling their
11 regulatory obligations with respect to providing
12 effective oversight of the supply chain.

13 It's also important to note that the
14 current NRC's Vendor Inspection Program is not a
15 substitute for licensee oversight of vendors, nor does
16 it relieve the licensee of his responsibility for
17 vendor oversight.

18 Appropriately, the EDO's tasking memo
19 asked us to consider these two specific items. Did the
20 SONGS steam generator event expose any new or unique
21 vendor lessons that the NRC's Vendor Inspection Program
22 should take into account?

23 And second, should the NRC's Vendor
24 Inspection Program be more focused on design aspects
25 of the major plant modifications at the vendor

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1 facilities?

2 Next slide please. As a result, the
3 Vendor Oversight Working Group was formed to provide
4 recommendations on vendor oversight enhancements.
5 The Working Group was composed of staff from Regions
6 II, Region IV, as well as from NRO and NRR.

7 Our review approach included the detailed
8 review of the current Vendor Inspection Program,
9 including the existing policy and practices, as well
10 as interviews with several senior NRC staff.

11 Next slide please. In response to the
12 first question from the ECO's tasking memo, regarding
13 whether the SONGS steam generator event exposed any
14 new, unique vendor lessons the NRC's Vendor Inspection
15 Program should take into account?

16 The Working Group identified two
17 attributes of large component design and manufacture
18 that were factors in the San Onofre event, and that
19 should be considered when selecting vendor for
20 inspection.

21
22 These attributes are not new or unique and
23 neither of the attributes individually led to the
24 design issues that resulted in the steam generator tube
25 degradation at San Onofre.

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1 Taken together though, they contributed to
2 the licensee and the vendor failing to identify and
3 correct weaknesses in the design before the degradation
4 occurred.

5 These attributes will be considered in the
6 selection of a Vendor Inspection and will weigh in the
7 determination point of our NRC Vendor Inspection
8 priority.

9 The first attribute was the use of the
10 FIT-III software by MHI, for the design of the steam
11 generators. The software had not been accepted as an
12 industry standard or approved by a regulatory body.

13 The second attribute although not specific
14 to vendor inspection, was the lack of detail in the
15 final safety analysis report concerning the design
16 characteristics, functions, and acceptance criteria
17 of the various components within the SONGS steam
18 generators.

19 Since each vendor has established the
20 design criteria and this criteria are generally
21 considered or treated as proprietary information,
22 minimal detail was described.

23 The review guidelines developed, as
24 proposed by the recommendation for Topic 3 that Emmett
25 described, is intended to result in the release of

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1 vendor information being provided to the FSAR.

2 In response to the second question from the
3 EDO's tasking memo regarding whether the NRC's Vendor
4 Inspection Program should be more focused on the design
5 aspects of a mega-plant modification?

6 The Working Group established, determined
7 that even though the design worthy aspects of vendor
8 issues of the magnitude identified at San Onofre are
9 infrequent, the Working Group is sending a yes. The
10 NRC's Vendor Inspection Program should be more focused
11 on the design aspects of mega-plant modifications.

12 Consequently as a result of this review,
13 the Working Group has identified two recommendations
14 for vendor oversight enhancements to the existing NRC's
15 Vendor Inspection Program that reflect the lessons
16 learned from the SONGS tube event.

17 The first recommendation is to perform
18 pilot design-aspect inspections at vendor facilities
19 during the fabrication process for safety-related
20 major plant modifications.

21 The NRC staff will evaluate the results
22 from the inspections to determine if such inspection
23 activities are warranted on a continuing basis. The
24 initial inspections should use existing inspection
25 procedures such as Inspection Procedure 37805 which is

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1 the Engineering Design Verification Inspections.

2 If a decision is made by management to
3 continue, the existing procedure may need to be
4 modified or a new procedures may need to be developed
5 using lessons learned from the pilot and Design Aspect
6 Vendor Inspections.

7 In support of the first recommendation,
8 the second recommendation is to develop and pilot, a
9 screening and evaluation processes to determine if a
10 plant change is a major plant modification, and whether
11 such a modification should be subject to an NRC Vendor
12 Inspection.

13 Specifically in coordination with NRR, the
14 regions and NRO, and also taking, we'll take into
15 account Industry input and comments. The staff will
16 develop identification areas and screening criteria to
17 determining when a plant change can be considered to
18 be a major plant modification.

19 MEMBER BLEY: Can I ask you a question?

20 MR. DIAZ-CASTILLO: Sure.

21 MEMBER BLEY: Earlier Doctor Powers, was
22 talking of first of a kind engineering and brought up
23 this idea that maybe it's not just first of a kind across
24 an industry, but first of a kind for a particular
25 manufacturer. And does that enter into your thinking

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1 at all? or have you talked about that concept before?

2 MR. DIAZ-CASTILLO: Yes, actually we
3 clearly have a Vendor Inspection Program, this is what
4 we used to perform vendor inspections. And one of the
5 actions that we're taking is that, evaluate the
6 experience that the manufacturing has with the
7 component that they're manufacturing.

8 So that will come into play when we move
9 forward with select vendors for inspection.

10 MEMBER BLEY: So both their experience and
11 their experience with a particular product?

12 MR. DIAZ-CASTILLO: Right.

13 MEMBER BLEY: Thank you.

14 MR. ROACH: If I could add in, this is Ed
15 Roach. I'm the Chief of the Mechanical Vendor
16 Inspection Branch. There's at least two example
17 within the new reactor realm, of some of the first of
18 kind technology developed.

19 SPX Corporation developed squib valves
20 under license to Westinghouse. And I know you've heard
21 about those. Those basically were an up-sizing of
22 traditional technology, but several challenges
23 occurred in the course of that up-sizing that needed
24 to be addressed and continued testing and development.

25 And then with the reactor coolant pump, if

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1 anyone has a Navy nuclear background, they would
2 remember the type of pump used on submarines. However,
3 up-sizing those has created some other challenges. So
4 in our VIP, we used first of a kind development and
5 technology as one of the weighting factors to evaluate
6 whether we go out and look at that.

7 MEMBER BLEY: I'm not sure if NRC can bound
8 it or not, but certainly a purchaser could. But at what
9 point, what criteria would lean you toward thinking
10 testing is required, rather than just a little more
11 inspection and close follow-up?

12 MR. ROACH: Quite a few of the key
13 components of, I'll take valves for example, if they're
14 committed to ASME, there would be a QME1 test required.
15 We have gone and observed those tests on squib valves
16 as well as the nozzle check valves which are also used
17 in the AP1000.

18 So, if as need testing, that may be a good
19 indicator of when we would go observe that technology,
20 because usually it's done on a prototype type valve.

21 MEMBER REMPE: I have a couple of
22 questions. Correct me if I'm wrong, but what I think
23 I read about this was these two attributes that were
24 identified were a part of a process that was a randomly
25 select spot check type of thing. It just happened it

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1 picked that item to go inspect.

2 And it wasn't something where it was a
3 focused spot check, where you would say now, if you're
4 going to something where the vendor is going beyond
5 their experience base, or the component is something
6 that's for new conditions. There's not a process in
7 place when a licensee buys something to decide smartly
8 what NRC is checking. And is that going to be changed?

9 Or is that still going to be a spot check
10 for Appendix B procurements?

11 And the second question I have is, when you
12 identified these two attributes with this particular
13 vendor. It wasn't the first time that they had
14 designed, fabricated, and installed a steam generator.
15 When you see something like this, does it trigger
16 something where you go and check other? I mean they
17 used new software that hadn't been approved, but will
18 they do that the earlier steam generator that they
19 designed and installed?

20 MR. ROACH: I think since I was
21 supervising the individuals who participated in the MHI
22 inspections and the SONGS AIT also.

23 My sense is that to your first question,
24 these attributes were attributes that we did not take
25 into account prior in our vendor inspection protocol

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1 or scoring. Because we hadn't seen it with some of the
2 new reactor vendors.

3 This was an operating plant vendor, and up
4 until about 2007, most operating plant vendors from
5 about '99, '98 to 2007 were done on a reactive basis.
6 And there wasn't a systematic inspection of operating
7 plant vendors.

8 So when the New Reactors Program came in,
9 they developed a more robust program which was a little
10 more proactive since we do international. Components
11 were being manufactured that we would go out and look
12 at some of those also.

13 So these two attributes, were pieces that
14 we drew out of the SONGS lessons learned, in that three
15 were programs that people used that didn't receive
16 industry acceptance. And we need to ask that question
17 in the course of our reviews of all the vendors we deal
18 with, just to make sure.

19 MEMBER REMPE: So maybe I'm not
20 understanding what I read, but Appendix, this was a
21 quality check on the procurement of a, this wasn't a
22 50.59 Item that got, that they did the review. They
23 were then because of the spot checking, a random
24 selected spot check?

25 Or was there any sort of Appendix B check

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1 of quality?

2 MR. ROACH: Maybe I'm confused. Who went
3 in and did a spot check? The Vendor Inspection Branch?

4 MEMBER REMPE: The NRC went in, but it was
5 not something, the NRC does not inspect new
6 procurements, regularly. It's just a random selection
7 that they will do periodically. And that's how these
8 two attributes got caught, I thought.

9 MR. ROACH: Actually these two came out
10 of, I think a combination of the AIT, because we members
11 of the AIT on our Working Group, and also in our lessons
12 learned from the MHI vendor inspection.

13 MEMBER REMPE: But they were originally
14 documented wasn't it because of a spot check. They did
15 it back, and the augmented team caught it, but it was
16 originally documented wasn't it, they just did a random
17 check on the procurement?

18 MS. SIGMON: I think there was, there's a
19 couple of different spots in the report where we talk
20 about sampling. And this particularly in the 59
21 Section on Topic 1, they talk about how when they
22 initially did the steam generator replacement, we did
23 a modification inspection.

24 And our inspection process, under the
25 procurement side process, is to perform samples. So

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1 your modification inspection will take a sampling of
2 the modifications and look at 50.59 evaluations that
3 were done.

4 And usually there aren't that many 50.59
5 complete evaluations, that will look all of them, but
6 they'll only take a sampling with 50-59 screening.

7 So I think that's where it's at.

8 MEMBER REMPE: That's the issue I'm trying
9 to get to, because I think it ought to be a smart
10 sampling. And is that going to happen in the future,
11 where you say --

12 MS. SIGMON: Well in this case, you know,
13 in this case modifications inspections generally look
14 at all of the 50-59 evaluations that were completed,
15 then do a sampling of the screenings. But it's
16 certainly a smart sampling process.

17 Where they say where, what were the safe,
18 significant modifications? What do we need to go
19 gather more data? And then as you're reviewing the
20 evaluations, do we need to, you know, is there other
21 questions being raised here that want us want to look
22 deeper? But that was separate from the vendor aspect
23 of it.

24 MR. ROACH: Yes, that's right.

25 MEMBER REMPE: Okay, right. So that's

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1 where I'm trying to go to. We've talked about first
2 of a kind. We've talked about this vendor experience.
3 And it seems to me that those ought to be triggers so
4 that it's not a random selection anymore.

5 MS. SIGMON: And I think that's part of
6 what we're working on here. Where Emmett and Yamir
7 were talking about, was incorporating you know, the
8 vendor inspection has to know that these things are
9 happening.

10 And coordination between the Region and
11 NRR to say, hey, there's this kind of modification
12 that's going to be happening. Here's the flag to, you
13 know, the Vendor Inspection Programs. This is
14 something they might need to weigh, and whether they
15 need to --

16 MEMBER REMPE: The problem's been
17 recognized and it will be addressed is what I'm hearing.

18 MS. SIGMON: And so what Ed was saying was
19 that prior to you know, the new reactor work, the Vendor
20 Inspections had been reactive. So unless there was a
21 problem, the Vendor Inspection wasn't going --

22 (Simultaneous speaking)

23 MEMBER REMPE: So are we going to be
24 instructing more proactive?

25 MS. SIGMON: That's what this program is

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1 about.

2 MEMBER REMPE: And then the other thing is
3 when you saw that, with this particular vendor, and it's
4 not the first steam generator that they'd ever designed
5 and up fabricated and installed. Is there a trigger
6 to say, oh, we ought to go check and see if there's any
7 issues? I mean how does the NRC function when they see
8 something like that?

9 MS. SIGMON: I think Emmett could probably
10 speak more to that, but there was a you know, who, what
11 else had Mitsubishi done?

12 MR. MCINTYRE: Maybe I can help you out
13 here. My name is Rich McIntyre and I was the Inspection
14 Team Lead at the Inspection at MHI in Kobe and on also
15 the MNES in Arlington, Virginia.

16 But a little history on the MHI design. We
17 had done a vendor, a routine vendor inspection back in
18 2008, to looking at the fabrication of the steam
19 generators. We did not look at design. And that's
20 what, you know, a fallout of this panel is to saying,
21 design into the future is something we could be or would
22 be looking at.

23 So we looked at the fabrication --

24 MEMBER REMPE: The Fort Calhoun steam
25 generator was, quote. Does the Fort Calhoun steam

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1 generator was designed by Mitsubishi as well as
2 fabricated and installed?

3 MR. MCINTYRE: Yes, it was. And that was
4 probably, that was an ongoing there, during that
5 inspection as it's a sample, we looked at the
6 fabrication for the SONGS steam generators as well as
7 some of the work they were doing for new reactors.

8 This was that time when we had just
9 transitioned into the Office of New Reactors, so we were
10 looking at what they were doing for new reactors as well
11 as the San Onofre steam generators.

12 But we did not look at, you know, we did
13 not look at the design aspect. But the utilities, San
14 Onofre, Fort Calhoun, South Texas, they had done a
15 number of supplier oversight of design activities at
16 MHI over the years.

17 So that's it, we weren't doing the design,
18 but as Yamir said, it's the responsibility of the
19 licensees and in their meeting of Criterion VII, they
20 were doing the oversight of the design activities.

21 Now, did they catch that? Obviously they
22 didn't. Neither did MHI in supplying three other steam
23 generators in Japan as well as San Onofre.

24 MEMBER REMPE: So I guess, again I'm not
25 trying to focus as Dick mentioned earlier, just on steam

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1 generators or the 50.59 process. There's a lot of
2 procurements that are done, and again I'm a lab rat,
3 but doesn't Appendix B for the NRC, isn't it supposed
4 to deal with quality procurements and does that come
5 into play?

6 MR. MCINTYRE: No.

7 MEMBER REMPE: Or what does come into play
8 with design, of a vendor design effort? And is there
9 some way to --

10 MR. MCINTYRE: Are we talking design, or
11 inspection now? Yes, Appendix is all, is from design,
12 fabrication, construction, all the quality aspects.

13 MEMBER REMPE: Right. And so does NRC
14 inspect on some of that design, on the procurements that
15 designed it, is there any sort of random selection
16 process or sampling process? Or exactly how is that
17 enforced?

18 MR. MCINTYRE: Yes, we do. We do on a
19 regular basis. We just did, like I was on one recently,
20 Ukraine nuclear valves in Chicago. And we looked at
21 the design aspect. All I'm saying is that for these
22 steam generators we did not look from a vendor
23 inspection perspective at design, at MHI. That wasn't
24 something we looked at.

25 CHAIRMAN RICCARDELLA: Can I make a

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1 comment. It seems like the focus of the actions and
2 response to Topic 8, have to do with direct oversight
3 of the vendor by the NRC. But ultimate responsibility
4 for compliance with Appendix B, lies with the licensee.

5 MR. MCINTYRE: Correct.

6 CHAIRMAN RICCARDELLA: And shouldn't the
7 Agency be doing something to confirm that the licensee
8 has properly qualified the vendor? And that he's
9 monitoring the implementation of the Vendor QA Program
10 during the design process? I think that was the big
11 short coming.

12 MR. DIAZ-CASTILLO: That's currently the
13 purposes when we go out and do inspections. Is that
14 we verify that the licensee is actually monitoring his
15 vendors. That's what we do. We issue either a
16 violations, like an instance, in a Part 21, or we issue
17 Notices of Non-conformances like in Appendix B.

18 So the purpose is when we go out to this
19 vendor inspection, is to verify that the licensee is
20 actually doing his job, by vendor oversight. And when
21 we usually find this, like in Appendix B, Notice of
22 Violation, or Notice of Non-conformances that's when
23 we can tell whether licensees are doing an effective
24 job.

25 CHAIRMAN RICCARDELLA: But you go to the

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1 vendor and you're independently looking at their QA
2 Program.

3 MR. DIAZ-CASTILLO: Right.

4 CHAIRMAN RICCARDELLA: But shouldn't
5 there be some level of oversight of the licensee to make
6 sure that they have properly qualified a vendor?

7 MR. DIAZ-CASTILLO: Well --

8 CHAIRMAN RICCARDELLA: My understanding
9 is that this vendor just did not have an adequate
10 Appendix B, Quality Assurance Program.

11 MR. DIAZ-CASTILLO: We did, like I already
12 said, we did a vendor inspection of MHI in 2008. And
13 we did verify their QA Program. And the evidence that
14 we verified, we verified when went then, adequately.

15 MEMBER SCHULTZ: But you weren't looking
16 at design.

17 CHAIRMAN RICCARDELLA: You weren't
18 looking at design is what I heard.

19 MR. DIAZ-CASTILLO: We were not looking at
20 design, because when we go do, we don't inspect the 18
21 criteria of Appendix B, when we go on inspection, we
22 do a sample of the criteria.

23 And in this case, with that inspection, we
24 did not verify the specific design implementation, so.

25 CHAIRMAN RICCARDELLA: Your horse was

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1 already out of the barn in 2008, wasn't it?

2 MR. ROACH: And to address I guess, the
3 vendor inspection is now a center of expertise within
4 NRO, and so we're working closely with NRR in a couple
5 of phases. One, is communicate. When we find vendors
6 who haven't received adequate oversight, we notify the
7 project managers for the affected sites, with a copy
8 of the inspection report, or even call them.

9 For instance, we've had one where a crane
10 equipment that wasn't, didn't meet specifications.
11 Listened to over five of the operations and the project
12 manager, and NRR immediately because we found that out.

13 So we do work closely with them to notify
14 them of licensees who don't adequately implement vendor
15 oversight when we find it.

16 So in this case, this was predating new
17 reactors space, and there was a time when, I think after
18 the transition to ROP, the value of vendor inspections
19 on Quality Assurance Programs with vendors was maybe
20 not as effective, or viewed as effective as it could
21 be.

22 So I just, that's just the past history and
23 so I think where we are today, is close coordination
24 with NRR, and looking for a way to screen major
25 modification whether it be a steam generator, digital

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1 I&C conversion, some other type of plant modification
2 that's going to require a vendor construct ability or
3 some vendor construction under Appendix B. We want to
4 see if that screens in, then we want to go look at it.
5 That's our ultimate goal out these recommendations.

6 MEMBER REMPE: So maybe I didn't
7 understand, you had the right answer at first, because
8 I'm slow. But you're saying that because of the new
9 reactors, that you are now doing more focused Appendix
10 B inspections for design?

11 MR. ROACH: Yes. Appendix B is
12 incorporated in every one of our inspections. Unless
13 we're going for, specifically if we go down to a company
14 called NTS, in Huntsville, it does specific flow tests,
15 seismic testing, or EQ testing.

16 We may focus on design control, test
17 control, non-conformances, corrective actions. You
18 know, aspects of Appendix B, because they're the ones
19 that really fit. We don't do an entire program because
20 we've been to that vendor probably a half a dozen times
21 in the last two years, and looked at most aspects of
22 their Quality Assurance Program.

23 MEMBER SKILLMAN: Let me pile on with
24 Doctor Rempe, there are 18 points in Appendix B. You
25 just mentioned a couple at this facility in Huntsville.

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1 But you didn't mention MT&E.

2 You can't have a good test program unless
3 you have good instrumentation, and good data, and good
4 output. And so I'm kind of where I was when we started
5 this meeting.

6 MR. ROACH: Okay.

7 MEMBER SKILLMAN: Maybe it was the change
8 between South and ROP, but there was a day in this
9 industry after 10 CFR Part 50, Appendix B, was born,
10 that everybody who was involved in design and
11 operations knew the power of a violation.

12 And there were people that were assigned
13 to make sure that every facet of Appendix B, including
14 design control, including ensuring that the Vendor's
15 Design Program and the Vendor's QA program were
16 effective. It was highly important.

17 The almost 48 years in this industry, I
18 have seen us move from a time when there was no Appendix
19 B, to a new Appendix B with a huge amount of compliance,
20 not only the letter, but the intent of the regulation.
21 And then a slow move towards cherry picking, only those
22 pieces that seem to make sense.

23 And when we've done that, we've lost
24 something. The whole collage of Appendix B is a suite
25 that needs to be enforced. And I would offer at least

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1 my years of consulting, there are times when industry
2 is gaming to not comply.

3 I would also offer, that there's a wide
4 variation in the degree to which a utility will fess
5 up on an evaluation, under 59. And some utilities are
6 very rigorous and thorough in using that as a screening
7 criteria for whether or not a license amendment request
8 is necessary.

9 And others treat 50.59 like it's a
10 modification process. They don't fully understand or
11 at least the evidence suggests, they don't understand
12 what that regulation really is all about.

13 So I just want to kind of get where Joy was,
14 and perhaps where Dr. Riccardella is, I think we've lost
15 something in the industry. And that's why I asked in
16 the early part of this, if somehow we can translate the
17 San Onofre lessons to a higher level?

18 So that the industry really is being
19 protected by regulation that they don't care for, but
20 it was one that can really protect them.

21 MR. ROACH: Well, the first thing I'd say
22 is that I did not mention MT&E, but MT&E is essential
23 to any test-in-full program. And we evaluate that.
24 We make sure they document their calibration, the right
25 serial numbers, and they're calibrated to fire. So

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1 I'll spot you that.

2 MR. DIAZ-CASTILLO: Yes, because --

3 MR. ROACH: I can't imagine that you would
4 do an inspection without that.

5 MEMBER SKILLMAN: I understand that.

6 MR. ROACH: And as far as your discussion
7 as to the way the industry has possibly migrated, or
8 their view of Appendix B has, I can't disagree with that
9 might be the case.

10 I mean, I left the industry in 2006 so I
11 would say that at the time I left, I understood the
12 purpose of Appendix B, Part 21, and why we followed the
13 regulations to the letter of the law. Because our
14 license depended on it.

15 In the vendor world, there are subsets of
16 the licensee and they have to follow the licensee's
17 purchase orders. And when we, we do sample vendors.
18 And I mean we go to vendors based on a prioritization,
19 we can't, we don't have the resources to do every vendor
20 who's supplying safety related equipment, components,
21 parts, services.

22 But we do sample them. And there have been
23 times when we've gone in to look at most of the 18
24 criteria, and come away with an Appendix, a Criteria
25 I finding. Because their organization didn't support

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1 all the other aspects of, and they had a Quality Program
2 that was ineffective.

3 And so we try to look at all of those and
4 at the same time look at their implementation of the
5 QA Program and the fabrication of controls. Do we get
6 it right every time? I can't guarantee that.

7 And in retrospect, whether we would have
8 found this interface problem at MHI? I don't know. We
9 would have had to dig really deep, but it was clear that
10 some individuals within the staff recognized that the
11 void fraction was different. And that keyed us looking
12 for things.

13 So our lesson learned is that, if there's
14 something that's not industry standard, we should be
15 digging into it. And we should be trying to understand
16 it, and get the right technical resources with us to
17 do that.

18 To the other end, Appendix B, I think
19 that's an Agency action and at a much higher level to
20 reinforce to all the licensees, that Appendix B is
21 necessary attribute of operating a nuclear power plant.

22 And I think INPO recently came out with
23 some guidance or information that, you know, I'm just
24 hearsay, I've read it once, that indicated that they
25 recognized there's been limitations in some of the

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1 engineering and vendor oversight the licensees have
2 provided.

3 MEMBER POWERS: Just recently came and
4 talked to Tulsa in fact, over that issue.

5 MR. MCINTYRE: Sure you bet. This Rich
6 McIntyre again, and you know I've been performing
7 vendor inspections here at the NRC 30 years. So I'll
8 tell you that the importance of Appendix B has not gone
9 away.

10 I mean from 1984 to 2015, we had a time
11 period there where we did less vendor inspections than
12 we had, say in my first 15 years, but we always go out
13 and use Appendix B criteria as our inspection
14 guideline.

15 Whether we go to a valve manufacturer and
16 we're looking at you know, since we're sampling, we'll
17 choose criteria that are applicable to the scope of
18 supply when we're there at that vendor. If they're
19 designing and manufacturing, we'll look at design,
20 we'll look at welding, NDE, and inspection tests, and
21 we always look at calibration when we're looking at
22 inspection tests.

23 So just to let, you could just say that
24 we're always looking at calibration when they're doing
25 any inspection and test activities. That is never not

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1 looked at during a vendor inspection where operational
2 exams are going on.

3 So it's just that in once new reactors was
4 stood up in 2007, we ramped the vendor inspection back
5 up. So we had a leaner time there where we really
6 weren't doing routine vendor inspections. We weren't,
7 we were doing reactive inspections for a number of
8 years.

9 And that's, and it is what it is. That's
10 the way it was. We didn't ramp up. Now we've gone from
11 new reactors and now we're doing the whole gamut where
12 we're doing operational. So we're doing operating
13 reactors, and new reactors on a regular basis.

14 So hopefully, we'll get back to what you
15 remember, and what I remember when we had a you know,
16 we had a full ongoing Vendor Inspection Program before
17 we went into that lull. Thank you.

18 MEMBER SCHULTZ: Yamir, I'm slowly
19 getting perhaps where I need to be with this, but on
20 your Slide 24, I've still got some confusion. And
21 that's the two attributes that should be considered
22 when selecting vendor for inspection.

23 And then I've got these two bullets, and
24 the first one I think I understand. I'm not sure how
25 you find this out. Or I'm guessing that many designers

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1 have this characteristic. They may be using
2 proprietary software that has not been reviewed by a
3 regulatory body, might not be an industry standard.

4 Most I think, might have that feature. So
5 I thought we would probably be trying to differentiate
6 people that would be on the list, or be prone to
7 inspection and those that would not. I'm not sure how
8 this differentiates?

9 If I were looking at this I'd be very
10 interested to know, of course if they have that kind
11 of software. And if they do, then has the project been
12 part of a quality program? Is it's software quality
13 assured? And so forth, I mean that's kind of getting
14 into it, but again I, for the purposes here, for
15 selecting vendor for inspection, I'm not sure how that
16 works.

17 The second one, I'm even a little more lost
18 on. How does one determine analytical methods to use
19 to develop, lacked rigorous acceptance criteria? Is
20 this meaning that somehow one gets this information and
21 then that vendor gets a mark that they don't have
22 rigorous acceptance criteria that they're using for
23 design A, B, and C? And we're looking at designs D?
24 I'm not sure how this is workable.

25 MR. DIAZ-CASTILLO: Do you want to speak?

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1 MR. ROACH: I'm sorry if I dominate, but
2 I think these two attributes are two additional
3 attributes to what we currently use in our Vendor
4 Inspection Program prioritization process.

5 And of those ones we currently use, it's
6 the number of licensees who use them, it's the type of
7 complex components they're manufacturing, it's whether
8 they're involved in testing. There's a whole litany
9 of them that we use as a matter to essentially develop
10 a weighting factor.

11 And then where that, so the mid-point might
12 be 20 points out of 42, so we tend to as thing go above
13 that, we look at them, and in some cases people below
14 that, we might go look at them because they're doing
15 a one all special, first of a kind, squib valve flow
16 test.

17 MEMBER SCHULTZ: Right.

18 MR. ROACH: So these two were two we're
19 trying to figure out how to fit into our current Vendor
20 Inspection Program. The first one, software, we do a
21 lot of human intelligence where we call the vendor's
22 quality manager, you know, about a month out, month and
23 a half out, saying hey, we want to come and look at you.

24 We understand you're doing this testing
25 you know, what software do you use, what equipment are

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1 you using, where's your facility? And we have to layout
2 the ground work for our inspection.

3 The second one I think comes from the fact,
4 of when we go to the design basis, whether it's in the
5 AP1000 DCD, whether it's in the FSAR for that plant,
6 whether it's in some other technical guide that was
7 provided to the NRC, we started digging through that
8 for the technical requirements that really govern this
9 component.

10 MEMBER SCHULTZ: Right.

11 MR. ROACH: And I think in the case of the
12 San Onofre, the PSR, as in many of the plants of that
13 generation, really was absent a lot of detail. And the
14 steam generator's is a steam generator that has X number
15 of tubes. It's tube sheet is 12 inches thick, you know,
16 it's recirculation design, it has a flow rate of x
17 number of pounds mass.

18 And that's really all that was in there,
19 was maybe a one sheet like that. So technical details
20 about what the void fracture, you know, we might have
21 got them once you carry over factors, things like that.
22 So we have to dig and develop to find what the details
23 are.

24 And so we relook at their purchase order,
25 you know, we try to see what they, is there an ASME

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1 standard incorporated, is there some IEEE standard?
2 Is there something else that they invoke as part of this
3 purchasing and fabrication requirement.

4 There's a lot of human intelligence
5 required.

6 MEMBER BALLINGER: You're saying you're
7 being detectives. Because they're not likely to tell
8 you the answer to those two questions.

9 MEMBER SCHULTZ: Right, I have a better
10 appreciation as you described it.

11 MR. ROACH: And there have been cases
12 recently, where we've actually had to perform what we
13 call, free inspection visits, to get documentation.

14 MEMBER SCHULTZ: Sure.

15 MR. ROACH: Prominently in the industry as
16 a diagram.

17 (Laughter)

18 MEMBER SCHULTZ: Well it begins to build
19 and makes some sense.

20 MR. LUBINSKI: John Lubinski from NRR, and
21 you know, and responsively you said being the detective
22 if you will. One thing to point out is we're talking
23 about the Vendor Oversight Program. It's really an
24 accompaniment to the current Licensee Oversight
25 Program. So where do we get this information about

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1 questions?

2 It comes from our current inspection
3 programs. We have, you know, the residents in our
4 special inspection teams that go out. And that's where
5 they're asking the questions, and are seeing this.
6 They're looking at what the licensee implementation is
7 of their Appendix B Programs.

8 What is the licensee's oversight of their
9 vendors? And then they're using that information to
10 communicate with the folks here at headquarters from
11 the Vendor Oversight, to say, we think this is an area
12 where we want you to look at the vendor. But it also
13 compliments is the licensee doing their job in looking
14 at the vendor?

15 Because many of the findings are not just
16 that the vendor did something inadequate, but did the
17 licensee do something inadequate? So this is not meant
18 to replace what we do in our current program. What's
19 required of the licensees?

20 Because the licensees still have those
21 requirements and our typical inspection programming,
22 including our residents, as well as our Regional staff
23 going out, are looking at these issues as well.

24 And when the response was about many of the
25 operating reactor oversight programs, as far as looking

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1 at vendor, looking at the vendor as being reactive as
2 Rich said. Those reactive based on either events or
3 operating experience but it was also through inquires
4 of our inspection programs where they say, you know,
5 this is an area ripe for looking at vendor oversight.

6 So that's the other key to it. So when you
7 say, you know, being a bit of a detective, it's the other
8 inspectors at the Regions that are the detectives, in
9 saying is this an area that needs additional oversight?

10 MEMBER BALLINGER: But that implies that
11 those Regional folks have got the expertise and
12 background to be able to notice a particular area that
13 needs looking at.

14 MR. LUBINSKI: From that stand point, when
15 you're looking at the resident who know all the major
16 modifications that are going on, they're looking at
17 50.59's modifications as well as those coming to
18 headquarters. And being able to look and have the
19 questions open. You know, did the licensee go out and
20 do an inspection at the vendor?

21 They have access to those records. Do
22 they have enough detail to say, that they're an Appendix
23 B expert? No they may not have that detail, but they
24 know enough to question. And they don't have to
25 necessarily do the inspection, but they call the guys

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1 at headquarters and say, here's what I'm seeing. Is
2 this right or not?

3 So that gives the indication of should we
4 do an inspection, shall we not. So they always have
5 had access to the experts at headquarters to ask those
6 questions.

7 MS. KULESA: That's what I was going to
8 say, is that we routinely get that. We work for John
9 Lubinski, in the Division of Engineering, and we
10 routinely get outreach from either the inspectors or
11 the Regions. They will call us to offer their
12 technical expertise.

13 MEMBER SCHULTZ: That was a good
14 discussion, that helped a lot.

15 MR. DIAZ-CASTILLO: All right. Where was
16 I. Sorry.

17 (Laughter)

18 MR. DIAZ-CASTILLO: All right, so we were
19 mentioning the actions, the staff will develop
20 identification, guidelines and screening criteria to
21 determine when the plan changes are a major
22 modification. And this effort is currently led by NRR
23 and the Regions.

24 Subsequently, the staff will develop a
25 screening criteria to determine whether a major plant

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1 modification -- I mean just because a major mod,
2 immediately we had to do vendor inspection -- we have
3 to evaluate whether that major modification should be
4 subject to a vendor inspection. And as well, this
5 effort is led by NRR and Regions with support from NRO.

6 MS. SIGMON: All right. Thank you. Just
7 to review, the overall conclusion of the lessons
8 learned review, of steam generator tube degradation at
9 San Onofre, is that they identified that NRC processes
10 and programs were fundamentally sound and they worked
11 as intended to ensure health and safety.

12 The review did identify some actions that
13 could increase the effectiveness of some of these
14 processes. These actions will be tracked through NRR.
15 Many of them are already in progress, especially for
16 actions that take place within the defined process,
17 such as changes to the inspection manual or generic
18 communication.

19 A project manager has been assigned to
20 manage these actions to closure, and status free things
21 on the product toward completion of these actions will
22 be conducted as needed, for staff management,
23 Commission PAs or closure as possible.

24 CHAIRMAN RICCARDELLA: Okay.

25 (Off the record comments)

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1 CHAIRMAN RICCARDELLA: We're opening the
2 line up if we have any Members out there, the public
3 or others who would like to comment or -- be opening
4 the line in a minute. It's open now, would somebody
5 please identify themselves just to make sure we can hear
6 you?

7 MR. HOFFMAN: This is Ace Hoffman.

8 CHAIRMAN RICCARDELLA: Okay. Do you have
9 any comments?

10 MR. HOFFMAN: Just a few.

11 CHAIRMAN RICCARDELLA: Okay.

12 MR. HOFFMAN: I'd like to start with just
13 saying that the phrase, smart sampling, it sounds more
14 like an oxymoron than anything I've ever heard in my
15 life. I heard at the very beginning some disparaging
16 remarks about the information of what the public would
17 understand about what was I believe, fluid elastic
18 instability. I believe the action word is fluid,
19 elastic instability.

20 CHAIRMAN RICCARDELLA: Yes.

21 MR. HOFFMAN: Okay, so despite hard to
22 understand something, and the key information is kept
23 proprietary. So we never did find out what really
24 caused one reactor, said steam generator's to vibrate
25 and the other one to vibrate in a different way, but

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1 not with fluid elastic instability.

2 And it was only very recently if at all --

3 (Off the record comments)

4 MR. HOFFMAN: -- you know whether one went
5 to a higher pressure and a lower flow rate, or lower
6 flow rate and a higher, vice versa.

7 Without that kind of information, you
8 can't expect the public to understand what was going
9 on. It's just not possible. If you produce more
10 proprietary of the so called proprietary information,
11 if you want to have us, the public be able to back up
12 what they're doing and make sure that everything is
13 actually working correctly.

14 Otherwise we can't really take part. Even
15 the people who were absolutely experts, because they
16 haven't worked at the plant for 25 years, couldn't
17 decipher what was going on. And even when they had
18 connections with other experts. It's just impossible
19 without the actual information.

20 So please don't knock us that way. And
21 besides, NRC's Community Engagement Panel I doubt there
22 was more than or two people there that had any
23 understanding of what fluid elastic instability was or
24 is. So those are my comments. Thank you very much.

25 CHAIRMAN RICCARDELLA: Okay. Thank you.

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1 Does anybody else from the public on the line, that
2 would like to make a comment?

3 Okay. Thank you. With that we will close
4 the line we'll go around the room to the Committee
5 Members. Dennis do you have any thoughts or comments?

6 MEMBER BLEY: No. I appreciate the
7 presentations. Especially it was valuable having the
8 folks who do inspections here today to help explain some
9 of what they do.

10 MEMBER SCHULTZ: I'll go ahead.

11 CHAIRMAN RICCARDELLA: Steve.

12 MEMBER SCHULTZ: I appreciated the
13 presentations. All three of the areas that we
14 discussed today were, I think as they were identified,
15 very important topics for the Agency to be considering.
16 And I thought that they were covered well.

17 I was glad to hear at the onset, Rebecca's
18 statement that we're not talking about ideas here,
19 we're talking about actions that are underway. I think
20 that's very important given that we've spent some time
21 evaluating the circumstances and situation. And it
22 appears to that have in fact identified some important
23 actions to be taken. So I'm glad to hear that we're
24 moving forward with those.

25 With regard to public interaction, I also

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1 think that's an area, as was identified in the
2 presentation, the Agency needs to provide additional
3 focus. I think the lessons learned were right on. And
4 I think that more good work needs to be done to identify
5 better ways for that public outreach and communication.
6 And I think this was a good discussion associated with,
7 and that the actions are moving in the right direction.

8 With regard to the vendor oversight, I
9 found that the discussion again, very insightful and
10 useful once I understood the components and how they
11 fit together. Again, I think the staff is headed in
12 the right direction to move forward with some very
13 important actions that will be helpful in the future.

14 MEMBER SKILLMAN: Thank you for your
15 presentation, for your thorough work here. It always
16 impresses me that the bulk of the NOV's are Criterion
17 III, design control, out of Appendix B, CFR Part 50.
18 And it just seems to me that, that is a hallmark of our
19 business, and it reinforces the need for focus at every
20 level on design, design basis, and change to design.

21 And this event in San Onofre is just a
22 remarkable example of how important that issue is. So
23 I appreciate these last several slide that point to
24 actions to dig into that. And I'm eager to hear how
25 the lessons learned from the SONGS event will be

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1 translated at a higher level.

2 And in fact, enforced isn't the right word,
3 because that sounds pejorative. How there will be some
4 renewed vigor around making sure that anybody in the
5 industry that's making a design change really
6 understands what's being changed.

7 What the original basis was, and how the
8 reactor coolant system pressure boundary, the fuel
9 boundary, and the containment boundary will be
10 preserved. Thank you.

11 CHAIRMAN RICCARDELLA: Dana.

12 MEMBER RYAN: I'm certain my colleagues on
13 the other side of the table covered all the key points
14 I think. Thank you. I'm all set.

15 CHAIRMAN RICCARDELLA: Ron.

16 MEMBER REMPE: I don't have any additional
17 comments. Except that I should also express my
18 appreciation and not only for the presentations but
19 also for interactions because as I've said before, it's
20 nice to have meeting material ahead of time.

21 CHAIRMAN RICCARDELLA: Mike.

22 MEMBER CORRADINI: Thanks to the staff.
23 I guess my only thought would be to you Pete, this is
24 something that you want to revisit, is this a one shot,
25 or is this something we're going to come back and hear

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1 about. Because a lot of the questions we've asked,
2 staff is still thinking and developing. That seems to
3 be that if this is really sometime we're concerned
4 about.

5 You guys understand from code and a QA
6 standpoint much more than I. What's the next step in
7 terms of hearing back from the staff?

8 CHAIRMAN RICCARDELLA: You know I think
9 what we heard was that this lessons learned report was
10 just as start and it identified some actions. And now
11 the staff is pursuing the details on those actions.
12 And I think they'd certainly be willing to review the
13 more details on those actions when they're available.

14 You know, I think a general comment, you
15 know you say that the, several times that the processes
16 worked and are sound to protect the health and safety.
17 But I would point out that this incident was one that
18 was inherently self-revealing in the form of a minor
19 leakage.

20 And that it had, there's a possibility that
21 you could have similar design issues in things that
22 wouldn't reveal themselves under ordinary operation,
23 but only an event say a design basis accident some kind.
24 And if we find problems like this then, it might not
25 be so self-revealing.

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1 MEMBER SKILLMAN: Or be so self-revealing
2 that it's stunning in its consequences.

3 MS. KULESA: Well as I had said earlier
4 during my remarks, it was all based on steam generators.
5 I was not commenting on other major systems or
6 components.

7 CHAIRMAN RICCARDELLA: Yes. We
8 understand that, but I think that improvements in the
9 process of heading off, you know confirming the
10 Appendix B, and the vendor, their qualifications are
11 much broader than that. Okay. And with that, I thank
12 you all. and the meeting is closed.

13 (Whereupon, the above-entitled matter
14 went off the record at 3:45 p.m.)

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UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

Advisory Committee on Reactor Safeguards Sub Committee

Review of Lessons Learned From the San Onofre Steam Generator Tube Degradation Event

April 8, 2015

Division of Inspection and Regional Support
Office of Nuclear Reactor Regulation



Outline

- Overview
- Key Actions
- Next Steps

- SONGS Lessons Learned Report issued March 6, 2015 (ML15015A419) examined NRC response to the events at San Onofre
- Identified 17 actions across the eight topics
- NRC processes worked as intended to ensure health and safety
- Specific areas identified where enhancements could result in more effective use of agency resources

- **SONGS Lessons Learned Report issued March 6, 2015**
 - Examined NRC response to the events at San Onofre
 - Multi-faceted inter-office review of all aspects of NRC response
 - Identified 17 actions across the eight topics
- **NRC processes are fundamentally sound**
 - Processes worked as intended to ensure health and safety
 - Specific areas identified where enhancements could result in more effective use of agency resources

- January 31, 2012 San Onofre Unit 3 initiated a manual scram due to indications of primary-to-secondary leakage.
- Following in-situ pressure testing that failed three additional tubes, the NRC chartered an Augmented Inspection Team
- AIT Report identified 10 unresolved issues which were resolved during subsequent followup inspections
 - Design control violation (10 CFR 50 Appendix B Criterion III) with White significance for Unit 3, Green for Unit 2

- Significant external outreach efforts stretched staff resources
 - Multiple public meetings, including several in California
 - Updates to public website
 - Web-based outreach
 - FOIA response
 - Interactions with Congressional/state/local leaders

- The three areas with the more significant actions identified in the report:
 - Topic 3 (Steam Generator Technical Review)
 - Topic 5 (Communication and External Interactions)
 - Topic 8 (Vendor Oversight)

Background

The cause of Unit 3's tube-to-tube wear was in-plane fluid elastic instability of U-bends associated with aggressive thermal-hydraulic conditions, combined with a lack of effective in-plane support for the U-bends.

Approach

- Staff involvement: NRR, NRO, RES, & Region IV
- Reviewed relevant documents (partial list)
 - Review of Safety Analysis Reports for Nuclear Power Plants
 - San Onofre Augmented Inspection Team Reports
 - Southern California Edison Root Cause Analysis
 - Mitsubishi Heavy Industries Technical Evaluation Report
 - ASME B&PV Code, Section III, Division 1, Non-Mandatory Appendix N
 - Regulatory Guide 1.20, “Comprehensive Vibration Assessment Program for Reactor Internals during Preoperational and Initial Startup Testing”

Conclusions/Actions

1. Is additional NRC guidance needed for SG design, replacement, or modification?
 - Yes. Develop two-tiered guidance to assist licensees, and the NRC licensing and inspection staff, in determining whether SG modifications necessitate a detailed review. Develop additional guidance for a detailed review of a SG design if dictated by the initial review.

Conclusions/Actions

2. Does the agency's SG program effectively handle new degradation mechanisms?
 - Yes. No modifications to SG program needed.
 - The SG program is not designed to address all degradation mechanisms. Some degradation mechanisms must be prevented during the design phase (e.g., rapidly propagating mechanisms such as fatigue and fluid-elastic instability).

Conclusions/Actions

3. Does the existing SG program effectively account for fluid-elastic instability?
 - The SG program was never intended to manage rapidly propagating degradation mechanisms.
 - Such phenomena must be precluded by design.
 - Should such phenomena occur unexpectedly, operational leak rate limits in the technical specifications and established SG tube rupture emergency procedures ensure that public health and safety are maintained.
 - Modifications to the SG program are not necessary to address fluid-elastic instability.

Conclusions/Actions

4. Does the agency or industry need additional standards for new or replacement SGs?
 - Yes. As described in Item 1, the staff is developing two-tiered guidance that can be used in evaluating SG designs, with respect to SG tube vibration issues. The staff has engaged the industry on specific actions they are taking regarding SG design standards and guidance.
 - Industry has been working with various vendors in developing a test matrix for a research project on in-plane fluid-elastic instability. The testing will be completed in Canada. The phased project has an estimated completion time of 3 years.

Conclusions/Actions

5. Are enhancements to the agency's SG inspection procedures needed?
 - Yes. The staff will revise the pertinent inspection procedures to ensure the two-tiered guidance discussed in Item 1 can be applied during the inspection and oversight process.

Background

- Agency spent significant resources conducting externally focused communication due to high interest.
 - Activities were not part of routine oversight processes
 - Limited guidance available to staff
- Review focused on potential improvements to agency processes for more efficient use of resources and more effective efforts for future situations.

Approach

- Conducted interviews and group discussions
 - NRC staff and managers (current and previous) involved with communications
 - Public meeting facilitators
- Reviewed relevant information
 - Various internal and external documents
 - Public meeting information
 - Webpages
 - Public meeting recordings
- Collected external input
 - Online survey
 - Discussions with attendees at Oct 2014 decommissioning public meeting

Conclusions

- Level of effort needed to conduct communication and outreach efforts had not been anticipated or budgeted for in advance.
 - NRC technical staff heavily involved, which impacted work on other activities
 - More leveraging of specialized communication expertise may have improved quality of products and messaging
- External feedback on NRC's communication efforts was generally positive, with areas for improvement noted.

Conclusions Cont'd.

- Public meeting insights
 - Consider alternative formats and other types of outreach
 - Convey meeting purpose more clearly
 - Provide more balanced opportunities for diverse views
 - Plan more effectively for amount of effort required for coordinating logistics
 - Plan more proactively for managing large crowds and potential disruptions

Conclusions Cont'd.

- Other communication efforts – lessons learned insights
 - Small group meetings
 - NRC Blog
 - Communication plans
 - External Website
 - External correspondence and FOIA requests
 - Calls with licensees
 - Coordination between staff and Commission
- Importance of engaging in more proactive communications, in more varied formats, for future situations

Actions

- Provide communication resources to assist technical staff when needs arise in order to:
 - Develop more effective tailoring of communication and outreach strategies
 - Increase capability to adjust as situations change
 - Allow technical staff to focus technical activities
- Implementation approaches:
 - Develop options for leveraging agency communication capabilities
 - Award of enterprise-wide contract for assistance with public meeting and outreach efforts complete

Actions Cont'd.

- Improve guidance in Inspection Manual Chapter 0351 to incorporate communication related lessons learned insights.
- Public meeting insights incorporated into “Enhancing Public Meetings” Task Group effort.
- Improve visibility and awareness of location where current communications plans are posted internally
- Number of improvements underway for FOIA response effectiveness.

Background

- EDO's tasking memo requested the staff to answer the following questions:
 - Did the SONGS steam generator event expose any new or unique vendor lessons that the NRC's Vendor Inspection Program should take into account?
 - Should the NRC's Vendor Inspection Program (VIP) be more focused on the design aspects of major plant modifications?

Approach

- Vendor Oversight Working Group (VOWG) established to provide recommendations on vendor oversight enhancements
- VOWG composed of NRC staff from Region II and Region IV offices, NRR and NRO
- Reviewed existing policy and practices, held interviews with several NRC staff

Conclusions

- VOWG identified two attributes of large component design and manufacture that should be considered when selecting vendor for inspection.
 - Use of proprietary software that had not been accepted as an industry standard or approved by a regulatory body
 - Analytic methods used to develop and evaluate the design lacked rigorous acceptance criteria

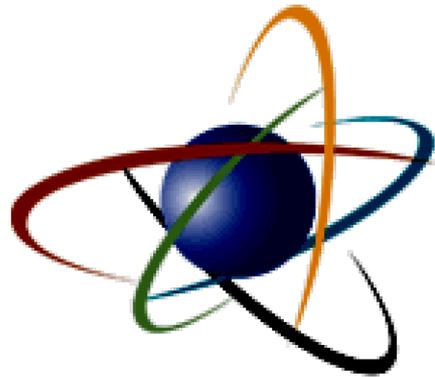
Conclusions cont'd.

- VOWG identified that the VIP should be more focused on the design aspects of major plant modifications
- VOWG pursuing two actions related to vendor oversight enhancements to the existing VIP

Actions

- Perform pilot design-aspect inspections at vendor facilities during the fabrication process for safety-related major plant modifications
- Develop and pilot screening and evaluation processes to determine whether a plant change would be considered a major plant modification, and whether such a modification should be subject to a vendor inspections

- Lessons learned review found NRC processes are sound and worked to ensure health and safety
- Actions identified that can improve the effectiveness of processes and programs
- NRR will track identified actions
 - Timeline to be developed with targeted completion dates
 - Many actions already in progress



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